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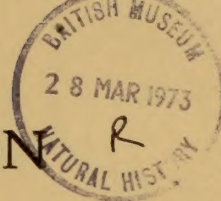








A REVISIONARY CLASSIFICATION  
OF THE RUTILIINI (DIPTERA :  
TACHINIDAE), WITH KEYS TO  
THE DESCRIBED SPECIES



R. W. CROSSKEY

BULLETIN OF  
THE BRITISH MUSEUM (NATURAL HISTORY)  
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BY  
ROGER WARD CROSSKEY

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# A REVISIONARY CLASSIFICATION OF THE RUTILIINI (DIPTERA : TACHINIDAE), WITH KEYS TO THE DESCRIBED SPECIES

By R. W. CROSSKEY

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## SYNOPSIS

A comprehensive re-classification is proposed for the Rutiliini, a Tachinid tribe confined to the Oriental and Australasian Regions. Diagnoses and identification keys are provided for all genera and subgenera recognized, and all nominal species are appropriately placed in the classification after examination of the types. Keys are given, under their respective genus-group taxa, to almost all of the 121 described species that are recognized as valid; it is emphasized that the species keys are only tentative, as species limits are often uncertain and several undescribed species are known. The proposed classification is summarized and an index-catalogue is provided to all nominal species-group taxa and their primary types. One new genus, one new subgenus and seven new species are described; 47 specific names and 15 genus-group names are newly placed in synonymy; 29 lectotypes and 12 neotypes are newly designated; and one new name is proposed for a preoccupied secondary homonym. There are 26 new combinations (excluding those implied by new synonymy).

## INTRODUCTION

THE Rutiliini include the largest and most handsome flies to be found in the Tachinidae, and the brilliant metallic colours and conspicuous patterns of many species make them outstandingly attractive insects. The group is not well known outside of Australia, where it pre-eminently occurs, and the glinting beauty of the metallic forms comes as something of a surprise to the non-specialist accustomed to think of the Tachinidae as just about the dullest of the Diptera.

Because of their showy colouring and flower-loving disposition the Rutiliines were among the first Diptera to be collected in Australia, and most of the expeditions of the late 18th and early 19th centuries that had touched at 'New Holland' (Australia), 'Van Diemen's Land' (Tasmania) or the islands of Melanesia brought back specimens that were described by the European naturalists. The most venerable surviving example is Fabricius' type of *Rutilia retusa* in the Banks collection in London which was described in 1775 and was probably collected on one of Captain Cook's voyages.

From the writings of the earliest workers on the group it is clear that they were much impressed by the wonderful 'new' flies coming from Australasia, and this is attested by the names—such as *imperialis*, *mirabilis*, *regalis*, *splendida*—they bestowed on them. Some of the first describers were not primarily dipterists, and the best early work on Rutiliini was produced by the coleopterist Guérin-Méneville (1843). By 1850 the rather surprising number of 44 nominal species had been described, and a further 40 nominal species were named before the end of the 19th century (mainly by Macquart, Walker and Bigot)—many of the names referring to features of the colour and marking.

The Rutiliini are more difficult to classify satisfactorily than would be supposed from their obvious appearance, and the fact that the bright colours and bold patterns can be relatively easily described has had one definite disadvantage in the systematic history of the group: it has tempted later workers to think that they could recognize the species described by their predecessors on the basis of the descriptions, without recourse to the types. Often this was not so, and both generic and specific nomenclature have been much confounded by the misapplication of names. The Rutiliini has also had its share of 'splitters', notably Townsend and Enderlein, creating what Paramonov (1968 : 351) amusingly called their 'deluge' of new genera. The misidentifications and generic splitting, together with the fact that no previous comprehensive study of old types was possible, has long meant that the systematics of Rutiliini have been in a bad state—as Paramonov put it we are 'left with the task of solving the riddles'. He himself had made an excellent start on this task, and Paramonov's (1968) posthumously published paper dealing with the genera other than *Formosia* and *Rutilia* is the best work on Rutiliini that has up to now appeared—in a class vastly superior to the superficial splitter's nightmare produced by Enderlein (1936) as a 'Klassifikation der Rutiliinen', which Paramonov so rightly deplored. Paramonov did not live to complete his projected work, and there was therefore no revision up to now of *Formosia* s.l. and *Rutilia* s.l., which together constitute about 70% of the Rutiliini.

The present paper is an attempt at a new comprehensive classification of the whole tribe. The work on which it is based grew gradually and inevitably out of the much

simpler objective of preparing an up-to-date catalogue of the Australian Tachinidae, a task which sounded easy enough but soon proved to be impossible without a really thorough revision of the Rutiliini. This group forms a very dominant element in the Australian Tachinid fauna, including at present about a quarter of the known species, and a catalogue of this large group based only on the muddled literature would have been not only useless but positively misleading. A dependable catalogue had to be based on a study of all the types, especially those of the early authors whose nominal species had been neglected or misinterpreted, so that realistic generic assignments and at least the obvious synonymies in genus-group and species-group names could be worked out. But even to make a generic assignment of a nominal species presupposes some concept of the generic limits, and when trying to place species into genera it soon became obvious that none of the existing generic classifications (Townsend, 1938; Enderlein, 1936; Paramonov, 1968) could be used satisfactorily, although that of Paramonov was outstandingly superior to any other (in fact my own classification here presented is in close accord with that of Paramonov in the number and scope of recognized genera). In short, the only way in which the Rutiliini could be satisfactorily catalogued was by first preparing a full-scale revisionary classification of the whole tribe.

The classification proposed here is based on the 'old-fashioned' methods of orthodox taxonomy, but the Rutiliini is a group which might lend itself well to the computer techniques of numerical taxonomy. The use of mathematical methods was considered at one stage of the work but it was decided to abide by conventional methods for the time being, in the hope that later on an Australian student might take up the group and test it by mathematical methods on far more material than is currently available. Two of the main difficulties with classical taxonomy in the Rutiliini are those of ranking of segregates and delimitation of species. Broadly speaking it is easy enough with suites of characters taken in combination to define segregates within the tribe (or, looked at the other way, aggregates of species) but it is a very subjective matter whether these are ranked as species-groups or genus-group categories; I have not always been completely happy at the choice of rank, for it is difficult to 'balance' recognizable segregates, but I am convinced that the groupings I recognize are natural entities whatever rank they may be accorded. On what is a species I am less happy, as there are real difficulties in several genera and subgenera in determining specific limits (some entities that are apparently species have distinctive and constant male genitalia, for example, but others either show no genitalic differences or some baffling variation).

Two particular aspects of the work require comment, the examinations of old types and the male genitalia. I have been able to see very nearly all of the types of the early authors (Bigot, Erichson, Fabricius, Gerstaecker, Guérin-Ménéville, Macquart, Walker, Wiedemann), only very few of which are lost; the types of Donovan, Gray and Robineau-Desvoidy are all lost. Examinations of these old types have enabled many formerly enigmatic names to be placed, either as valid names or as synonyms (because of the difficulty in some groups of deciding on specific limits, synonyms have only been established if there is very perfect agreement of types), and have unmasked several misidentifications.

A particular study has been made of the male genitalia. Malloch (1929, 1936), Engel (1925) and Paramonov (1968) published a few figures of male terminalia, but made no systematic study of them. In the present work the male genitalia have been examined for the great majority of species in order to assess their usefulness in classification; the outcome has been to find that they have very limited use for supraspecific classification but in many groups provide valuable characters at specific level (for further detail see the section on taxonomic characters).

The larger museum collections of Rutiliini, especially those at Canberra and London, contain specimens of several species that are obviously undescribed. I have not attempted to place these in the keys to species, which have been drawn up to cover only those species already described (as the title of this work states), but I have here described seven new species and these are placed in the keys. The new species have been described here for definite purposes: either because they show characters that significantly extend the range of form or colour previously known in the taxa to which they belong, or because they extend the previously known geographical range of their genus or subgenus, or to clarify species-complexes in which there was no available name for one of the constituents. Other new species known in collections have not been described because there are no cogent reasons at present why they need be named.

I must advert in this Introduction to the classification, briefly referred to above, of that entomological Jack-of-all-trades, Günther Enderlein. The paper of Enderlein (1936) on the Rutiliini was, luckily, his only venture into the Australian Tachinidae, except for his description of *Microtropesa violacescens*. It contains the usual lavish erection of unnecessary Enderleinian genera, 16 new genera in all, of which only one is given any recognition in my classification (this as a subgenus of *Rutilia*); I agree whole-heartedly with the late Dr Paramonov's stricture that 'these genera are unwarranted and very often misleading, as they are based on erroneously identified species of the early workers'. It should be added, however, that many of Enderlein's species are valid, even if their descriptions are excessively perfunctory by 20th century standards.

The genera *Oxyrutilia* Townsend, *Ola* Paramonov and *Ruya* Paramonov do not appear in the present work although they were placed by their describers in the Rutiliini: the first of these genera is a synonym of *Nemoraea* Robineau-Desvoidy (tribe Nemoraeni) as Paramonov (1968 : 351) established, and the other two are excluded from the Rutiliini as here defined for the reasons given on p. 22.

The figures accompanying the text of this paper have all been drawn personally. Those of the male genitalia are in the form of simple outlines with the hair vestiture omitted, as it is *shape* which is important for recognition and highlights the essential differences (or resemblances)—over-fussy drawings with every hair in place are usually not a virtue in Calyptrate taxonomy (unless of course the characters, as sometimes happens, reside in the vestiture itself). Some of the drawings are semi-schematic, notably those of chaetotaxy, which is often better represented by the pores than by the bristles themselves.

Finally in this Introduction I must refer to my use of the subfamily name Proseninae. For some years this name has been current for the very large subfamily

once known (wrongly from the nomenclatural viewpoint) as the Dexiinae, and I have here continued to use the subfamily name Proseninae although it is clearly not the oldest available name for the taxon. The family-group name Proseninae dates from 1892, and is pre-dated by several family-group names proposed by Brauer & Bergenstamm (of which Rutiliidae itself is one) and probably by other even earlier names. It will be a very complex nomenclatural question to resolve which of the many family-group names in the Tachinidae are based upon genera belonging in the 'Proseninae', and which of them should be brought into use as the valid name for this subfamily; until this can be done thoroughly, with a real prospect of long-term stability, I consider it best to continue using the name Proseninae as I have done in the present work.

#### MATERIAL AND METHODS

The revisionary work presented here has been based on the extensive collection of Rutiliini housed at the British Museum (Natural History) and on the assembly of as many of the primary types as possible from overseas museums. Most of the types in depositories in Sydney and Canberra were examined during a visit to Australia in 1965, and Macquart's types (which could not be borrowed) were studied at the Paris museum in 1969. Primary types have been examined of 151 species-group nominal taxa out of the 168 for which type-material is known to be still in existence; for the remaining few names type examination was either not essential because the species were recently and very well described, or was not possible because types could not be loaned and there was no opportunity to examine them (e.g. Macquart's types of *Amphibolia valentina* and *Diaphania testacea* in Lille). Some types are lost (surprisingly few in view of the relative antiquity of many of the names) and a few have not been located but may still exist. The primary types of the 168 nominal taxa with located types are distributed as follows: 54 in British Museum (Natural History), London; 49 in Australian collections (Australian National Insect Collection, Canberra; Australian Museum, Sydney; School of Public Health and Tropical Medicine, Sydney); 34 in Museum für Naturkunde der Humboldt-Universität, Berlin; 14 in Museum National d'Histoire Naturelle, Paris; 12 in small European museums (Brussels, Leiden, Lille, Stockholm and Vienna); and 5 in North America (New York and Washington). Seven new species are described in the present paper from material in the British Museum (Natural History) and their holotypes are in this museum.

Small collections of Rutiliini from the museums at Oxford, Leiden and Paris, and from my own collecting in New Guinea and New Britain, were at hand and taken into account during the preparation of this paper.

The early stages of Rutiliines remain almost completely unknown, and only adult flies have been studied. These do not require any special techniques, but some comment may be helpful on preparation and figuring of male genitalia. Rutiliini, being bulky flies, have sizeable male genitalia which are difficult to slide mount satisfactorily, even with cavity slides, though permanent slide preparations should always be made using such slides; nearly always the hypopygium rolls at least slightly

out of position in a permanent preparation so that an undistorted profile or apical view is not given. It is therefore vital to examine the hypopygium in fluid and to compare the shapes of the surstyli and cerci against the figures *before* slide mounting. All the accompanying figures of the male epandrium, surstyli and cerci have been drawn from whole hypopygia removed from the flies, slightly softened in potassium hydroxide solution, and mounted in fluid to show either the shape in profile (lateral view) or in apical view. Some of the specific differences in shapes of surstyli and cerci are very subtle, and to get comparable posterior views the hypopygium has always been orientated in such a way that the sclerotized dorsal part of the epandrium is just visible above the 'open' membranous part. This should be kept in mind when comparing an apical view of the male hypopygium against the figures. As a rule it is not possible to obtain very satisfactory views of the male hypopygium by extracting it in situ on relaxed flies; some very important features lie at the bases of the surstyli and may be concealed under the epandrium and overlooked unless the hypopygium is completely removed, so that it can be viewed from various angles in fluid at least while an identification is being made. (Examination of the male hypopygium is only needed at the specific level, and as species do not normally show important characters on T5 or on sternite 5 it does not usually matter greatly if the surrounding parts of the abdomen are slightly damaged when the hypopygium is removed.)

When describing the leg chaetotaxy the convention is followed of imagining the leg to be extended at right-angles to the longitudinal axis of the fly, when: *ad* = anterodorsal, *av* = anteroventral, *pd* = posterodorsal, and *pv* = posteroventral. The close-set comb of setulae on the hind tibia of many forms is referred to as the *ad* fringe, using the conventional positional terminology '*ad*'; this equates with Paramonov's (1968) term 'externodorsal'.

The abbreviations used for thoracic chaetotaxy are: *acr*, acrostichal setae; *dc*, dorsocentral setae; *ia*, intra-alar setae; *ph*, posthumeral setae; *stpl*, sternopleural setae. Position before or behind the transverse suture of the mesonotum is indicated by *prst* (presutural) and *post* (postsutural) respectively, in the normal convention; hence *prst dc* indicates presutural dorsocentral setae, *post ia* indicates postsutural intra-alar setae.

Abdominal tergites are indicated by the letter T followed by the appropriate number; the composite first apparent tergite is T1 + 2, the last visible tergite T5 (Text-fig. 28). (It should be noted here that Paramonov (1968) referred to abdominal tergites by their apparent number, not by their correct numbering on the basis of morphological segmentation: his 'first' tergite is correctly T1 + 2, his 'second' and 'third' tergites are T3 and T4, and his 'fourth' tergite is T5.) For the convenience of Australian workers the terminology of the parts of the male hypopygium is that adopted by Colless & McAlpine (1970) in their work on Australian Diptera.

#### ADULT CHARACTERS AND THEIR TAXONOMIC VALUE

At present only morphological characters of adult flies are available for classification and species recognition. The following account details the characters that

have use in taxonomy at supraspecific and specific levels, and indicates briefly some of the features which (at any rate on present evidence) have no taxonomic usefulness.

#### BODY COLOUR AND POLLINOSITY

These are so closely interlinked, the appearance and pattern being largely determined by the distribution of the pollinosity and its density, that they are considered together. Useful specific characters, and to some extent supraspecific characters, are provided by the extent of visible metallic coloration; some taxa are characterized by having the parafrontals (sometimes also the parafacials) brilliantly metallic instead of pollinose (as is usual), and some have the genal dilations and epistome partially or entirely metallic. Metallic colouring of the abdomen is especially important, several segregates being characterized by the occurrence of transverse metallic bands or spots on most of the tergites (usually the metallic colour being golden green to coppery red). The presence and extent of metallic coloration on the abdomen provide useful characters at several levels, but in some groups there is conspicuous intraspecific variability; in some *Chrysorutilia* species, for example, the metallic pattern may consist of continuous transverse bands or of broken or partially coalesced metallic spots in the same species (and there is a tendency for females to have more complete banding than the males, which more frequently have the metallic pattern in discretely isolated spots).

The ground colour of the head and its overlying pollinosity often provide useful characters for distinguishing allied species, and some supraspecific aggregates may have a particular head colour (a brilliant golden yellow head is a common form which appears in unrelated groups). The thorax normally shows traces of whitish pollinosity over the prescutum at least, and conspicuous spots of 'thick' white pollinosity occur in many forms in a standard pattern on the thoracic dorsum and often on the mesopleura and sternopleura; the presence of such bold spots is often a specific or group character. In some species the spots, especially those on the mesopleura, may have a more 'shifting' appearance with the direction of the light than in others. The mesonotum typically shows four blackish vittae, and the boldness and extent of interruption of the vittae at the transverse suture sometimes provide (somewhat tenuous) specific differences. Some species and groups are characterized by having the thorax and abdomen uniformly dark, in which case mesonotal vittae are not evident.

Leg colour and, to a minor extent, antennal colour can provide useful specific characters. In some forms, however, such as *Chrysopasta* there appears to be intraspecific variability in leg colour, and it appears likely (but is yet to be proven) that some species of *Microrutilia* may have sexually dimorphic leg colour (black in males, reddish yellow in females).

Hair colour is of no importance at the supraspecific level and its significance at the species level is far from clear. Several very closely related and virtually inseparable species differ by having either black or mainly yellow pleural hair on the thorax, and it is possible that some species are polymorphic in hair colour; it seems probable, too, that some species may be sexually dimorphic in this feature, males having black pleural hair and females having yellow pleural hair (as in some species of the Goniine

genus *Winthemia* Robineau-Desvoidy). (In the present work it has been impossible to come to any definite conclusion about polymorphism or sexual dimorphism in hair colour, and nominal species have been treated as valid if their types differ in the colour of the pleural hair.) Colour of the parafrontal, genal, postbuccal, coxal, femoral, tibial, and ventral and apical abdominal hair has limited value as a specific character. Bristles of the chaetotaxy are nearly always black, but some of the bristling in a few species of *Chrysorutilia* is golden red (especially the postalar and vertical setae and the postocular setulae); the significance of this abnormal bristle colour is not clear.

#### CHAETOTAXY AND HAIRING

*Chaetotaxy in general.* The most striking feature of the chaetotaxy in the Rutiliini is its instability, much of the bristling being less constant in this tribe than in other Proseninae and incomparably less constant than in the higher Tachinidae (Tachininae and Goniinae). In the Goniinae, particularly, the principal bristles are very constant in arrangement and size, and whole tribes may have a uniform arrangement of many of the setae—for example all the Sturmiini have 3 + 4 dorsocentral setae. In the Rutiliini there is not only intraspecific variability among many of the setae in their number, but also in their degree of development and differentiation from the surrounding hair; there is often also a lack of bilateral symmetry in the bristling of individual specimens, and a few species are sexually dimorphic in certain of the setae (e.g. median marginal setae present on abdominal T<sub>3</sub> in females but absent in males). Failure to appreciate the inconstancy of the chaetotaxy led Enderlein (1936), working with rather limited material, to erect several untenable genera on the basis of supposed chaetotactic differences, and in the case of *Hega* Enderlein (based on male specimens) and *Chromocharis* Enderlein (based on females) to propose genera for the opposite sexes of the same taxa.

In spite of the variability in the chaetotaxy, and the fact that almost any chaetotactic character will fail in the occasional specimen, it is none the less the case that the chaetotaxy provides some of the most important characters for supraspecific classification—and that several of them are essential key characters by which genera and subgenera can be readily enough distinguished. The existence, however, of isolated specimens showing chaetotactic characteristics which conflict with the norm for their nominal taxon has always to be kept in mind (especially as it is virtually impossible to cover every conceivable variant in odd specimens in a practical key).

*Head chaetotaxy.* There are few features of the head setae of use in classification. The *ocellar setae* are normally small or virtually absent and but little differentiated from the long hair of the ocellar triangle. The *vertical setae* are represented only by the inner pair, which shows no useful features. The *frontal setae* are usually very small and fine (Text-fig. 3), often little more than short hairs, and frequently the two rows of frontals do not meet at the tips; critical examination might yield minor specific differences, but there are no obvious taxonomic characters in the frontal setae. *Proclinate orbital setae* are always absent in males and are often extra-

ordinarily reduced or absent in females; when present in females their size and number often vary, and may be different on each side of the same specimen, but nevertheless there is a tendency for their normal presence or absence in different segregates. The *vibrissae* are sometimes long and strong but most often are weakly differentiated from the peristomal setae and from the small setulae above the main vibrissae (Text-fig. 3); they have no real taxonomic use. The facial ridges are bare, but in *Chrysopasta* small setulae extend up them further from the main vibrissae than is usual. The row of *postocular setulae* varies somewhat in length and might, if sufficiently studied, show minor specific differences in males.

*Thoracic chaetotaxy* (Text-fig. 9). The most valuable chaetotactic characters are on the thorax, and several groups of thoracic setae provide generic and subgeneric characters. The basic number of *humeral setae* is four, two on the outer half and two on the inner half of the humeral callus, but in some *Rutilia* s.l. the inner pair is absent or virtually so. The posthumeral setae (*ph*) are typically developed in some genus-group segregates and undeveloped in others but are of very minor taxonomic usefulness; often their development is variable, and in males *ph* setae may be undifferentiated from the prescutal hair although distinct in females. The *acr* and *dc* setae are especially variable and almost no use has been made of them in the present work; in *Formosia* the presence of a distinct *prst dc* seta in one group and not in others has been noted. Some segregates characteristically show some strong slightly spiniform setae on the scutum between the hindmost setae of the *acr* and *dc* rows (so that the scutum shows a rather continuous transverse row of strong setae immediately before the scutellum); the presence or absence of these *supernumerary prescutellar setae* provides a minor taxonomic character. The pre-alar and supra-alar setae are extremely variable in development and have no taxonomic value; the *pra* seta may be present or absent in the same species or on the two sides of the same specimen, and there may be several supra-alar setae or only one in the same species. The *notopleural setae* are normal (1 + 1) in almost all forms, but a few curious species from the Philippines have a well developed third notopleural seta standing very close to the normal posterior notopleural (i.e. 1 + 2 notopleurals), the hind pair standing on an unusually prominent knob-like swelling of the notopleuron. Intra-alar setae occur only as *post ia* setae on the scutum, and there is never a *prst ia* seta in Rutiliini, but the *post ia* are often intraspecifically variable; typically in any species there may be only one *post ia*, but almost always occasional specimens will be found in which a second or even third *post ia* is present, and in species in which there is normally more than one there may sometimes be found only a single *post ia*; consequently the *ia* setae have very limited taxonomic value.

The most dependable thoracic setae for taxonomic purposes are the *postalar setae* on the postalar callus, the *sternopleural setae*, and the *scutellar setae*. Omitting *Chetogaster* (which has two postalars like normal Tachinidae) the Rutiliini are very exceptional in having more than the basic two setae developed on the postalar callus, there being either three very strong setae or four or five (exceptional specimens may even have six, with or without a weakly developed seventh seta). The possession of either three postalars or more than three appears without doubt to aggregate Rutiliine species into natural groupings, though the development of one

or more supernumerary postalar setae (in addition to the basic two) has evidently occurred several times over in different evolutionary lines—hence different genera and subgenera have either three or four (+) postalars, and the common possession of either of these numbers does not indicate that the genus-group taxa involved are necessarily phyletically close. Unfortunately the number of postalar setae is *not absolutely* dependable in every specimen, for very rarely specimens do occur in which the postalar callus has three setae on one side and four on the other (in this case it seems from other characters that such specimens always, or nearly always, belong to taxa in which 4+ is the norm for postalar setae). The sternopleural setae provide some useful supporting characters in the definition of genus-group segregates, some typically having only a single (posterior) *stpl* seta and others having either 1 + 1 or 2 + 1 *stpl*, but some variability occurs; for example groups normally having 2 + 1 may lack one of the anterior pair in some specimens or on one side of a specimen, and groups normally having 1 + 1 *stpl* may have the anterior one virtually indistinguishable from the sternopleural hairing (especially in the male). No taxonomic characters have been discovered in the mesopleural, hypopleural, propleural or prostigmatic setae; there is no definite pteropleural seta differentiated from the tuft of long strong pteropleural hairing below the wing-base in any Rutiliini.

The scutellar setae show characters of value in the definition of genera and subgenera. The number and strength of marginal scutellar setae vary much, but the position of the apical pair (whether inserted lower than or level with the other marginals) provides a very dependable character (in all *Formosia* s.l. for example the apical scutellars are level with the other marginal scutellar setae, whereas in *Rutilia* s.l. they are set at an obviously lower level on the tip of the scutellum). In some segregates the scutellum carries a transverse row of small but distinct preapical setae lying in the same horizontal plane as the marginals, and these provide a useful character (though there is some variability in their number and size it is nearly always certain whether they can be classed as present or absent).

In some forms the thoracic setae (especially the supernumerary prescutellars, if present, the scutellars, the postalars and some setae on the venter of the sternopleura in front of the middle coxae) are markedly spiniform; in this case they are usually stiffer, straighter and relatively shorter than in other forms. In some genus-group segregates (notably *Formosia* s.l. and *Rutilia* s.str.) the development of strong spiniform setae can be very striking, but it is difficult—because of intergradation with forms with more normal bristling—to use the spiniform nature of the setae as a taxonomic character.

*Leg chaetotaxy.* The legs provide few useful taxonomic characters. The setae of the fore and mid legs (such as the *pv* setae of the fore tibia and *ad* setae of the mid tibia) may vary in size and number and no useful features have been found. Some forms have very heavy spiniform bristling on the mid and hind coxa but this cannot be used as a dependable character. The development of the *ad* fringe of the hind tibia, whether formed as a regular close-set comb or as a sparse irregular row of *ad* setae and setulae, sometimes provides a helpful character, and is sometimes correlated with a different number of *pd* setae on the hind tibia (though this can be intraspecifically variable or show sexual differences, e.g. *pd* setae absent in

male but present in female). In *Formosia* s.str. the whole anterior surface of the fore coxa is haired, this feature distinguishing the segregate from all other Rutiliini (in which the anterior surface is bare except near the apex). In the genus *Prodiaphania* some valuable specific characters are provided by the setae of the ventral surface of the hind femur, and in some species by a series of long setulae found on the *ad* surface of the hind metatarsi of the male (such setulae occur nowhere else in the Rutiliini).

*Abdominal chaetotaxy.* The presence or absence of long strong setae on T5, of discal setae on the intermediate tergites, and of median marginal setae on T3 provide useful characters at various taxonomic levels. The bristling of the inner ventral ends of the tergites, where they nearly meet in the mid line of the abdominal venter, varies much in strength and is sometimes spiniform; the direction of these setae, whether pointing downwards (as in *Formosia* s.l.) or mainly backwards and only slightly downwards (as in most other genera) has some value as a character at generic level. The arrangement and nature of the vestiture of T5 are often especially important, some segregates showing long haphazardly arranged setae, others one or two regular transverse rows, and others having little more than sparse weak hairing; some unusual species from the Philippines show short stubby setae irregularly inserted over most of T5. In many forms the abdominal chaetotaxy is exceptionally strongly spiniform, but there are various degrees of 'spiniformity' in different genus-group taxa and the spinous setae cannot in themselves be used as a taxonomic character.

*Hairing.* The presence or absence, or extent, of hairing on different parts of the body can provide valuable taxonomic characters at species-group, or genus-group levels. In *Rutilia* s.l., for example, a valuable character for distinguishing the subgenera *Chrysorutilia* and *Ameniamima* from other subgenera (and indeed from all other Rutiliini) is the extent of hairing on the pteropleuron; in these segregates the hairing on the pteropleuron extends well forwards on the sclerite, reaching to a level much in front of the posterior *stpl* seta (Text-fig. 19), whereas in other Rutiliines the anterior half of the pteropleuron is bare and there is virtually no hairing in front of the level of the posterior *stpl* seta (Text-fig. 20). In *Formosia* s.str. the whole anterior surface of the fore coxa is haired, this feature distinguishing the segregate from all the other Rutiliini (in which the anterior surface of the fore coxa is bare except near the apex). Bare or haired parafacials distinguish many closely allied species, and some genus-group segregates contain only species having fully haired parafacials (e.g. *Chrysorutilia*). The barete is completely haired in nearly all Rutiliines but some *Chetogaster* species have the hindmost part of the barete bare; the type-species of *Chetogaster* and some closely allied species show a minute tuft of fine hairs on the mediotergite beneath the lower calypter (infrasquamal setulae), but the mediotergite is totally bare in all other forms. Rutiliini normally have the propleuron thickly haired, but very rare individual specimens (therefore no taxonomic significance) have it bare.

The most important taxonomic characters of the hairing lie in the postalar wall and the suprasquamal ridge (Text-figs 21-25), both of which may be haired (but

never both in the same taxon). In some genus-group segregates the postalar wall (i.e. the vertical lateral declivity of the postalar callus, below the rounded margin bearing the setae) has a thick tuft of long dense hair, but in most groups the postalar wall is bare (or at most has just one or two hairs on its extreme upper part immediately below the ridge of the callus); in other segregates the suprasquamal ridge is most often haired, either with long dense bushy crinkled hair which is so thick that the centre part of the suprasquamal ridge cannot be seen or with rather short sparse hair under which the whole of the ridge is clearly visible (the nature of the hairing therefore provides a useful character as well as its presence). A few segregates (including the genus *Rutilodexia*, the subgenus *Ameniamima* and some species of *Rutilia* s.str.) have both the suprasquamal ridge and the postalar wall bare, but most often one or the other of these structures is hairy.

Presence or absence of hair on the prosternal membrane (Text-fig. 18) has some taxonomic value. In *Chrysorutilia* and the aberrant species *Rutilia micropalpis* there is hair on the anterior margin of the prosternum as well as on the membrane, but hair actually on the prosternum itself does not occur in any other Rutilini.

The hairing of the abdomen and male hypopygium shows no characteristics of supraspecific taxonomic value, but there are sometimes minor differences at the specific level in the length, strength and bushiness of the hairing, especially on the epandrium and surstyli. Hairing on the surstyli provides some particularly good specific characters in *Prodiaphania*.

Hairing on the arista ranges from extremely short micropubescence to moderately long plumosity, and is generally similar in the species of any particular subgenus; arisal hairing therefore provides a character of some minor value at the supraspecific level.

#### HEAD (Text-figs 1-3)

The most important taxonomic character at supraspecific level is the shape of the *facial carina*, which Paramonov (1968 : 355) used in the first couplet of his key to Rutiline genera. Particular genera and subgenera usually show a moderately constant facies in carina shape, but there is normally also some intraspecific and interspecific variation and the character is not so easy to use in practice as Paramonov's key implies. In some segregates the carina forms a prominent convex knob between the antennal bases and becomes slender and sharper towards the epistome, while in others it is very broad along its length and has subparallel sides; the latter form of carina often shows, superimposed upon its basic shape, either a trace of a median sulcus or a median ridge. The *epistome* is always slightly prominent in profile, and often subnasute, and is rather constant in shape in any segregate; in forms with a bulbous facial carina the epistome is normally very prominent and the face in profile is deeply concave between carina and epistome, but in forms with a broad flattened carina the epistome is usually less prominent and not conspicuously differentiated in profile from the epistome by a deep saddle. Most Rutilines have a well developed haired dilation on the gena (the so-called *genal dilation*), but in a few forms (especially *Rutilodexia*) there is very little genal dilation and the dilated part

is widely separated from the vibrissal area (not reaching nearly as far forwards on the head as the front of the eye, Text-fig. 5).

The eyes are well separated in both sexes in the majority of forms, but in *Formosia* s.l. many species have the male head nearly holoptic. In these the upper part of the frons is almost obliterated, and the upper ends of the very attenuated parafrontals may meet in the mid line (obliterating the upper part of the interfrontal area completely). When the eyes are very nearly touching, the uppermost facets are usually very conspicuously enlarged, and the closeness of the male eyes and facet enlargement can provide useful specific characters. In all Rutiliini the eyes are totally bare. The eye-height in relation to the width of the gena will probably provide significant specific differences when sufficiently studied. The ocellar triangle is exceptionally prominent in forms with the male head virtually holoptic (a correlated feature).

The form of the *buccal opening* provides a character of some taxonomic importance. In most forms the opening at its narrowest (near the middle) is conspicuously wider than the facial carina, but in the genera *Prodiaphania* and *Formodexia* the buccal opening is unusually elongate and narrow (especially in the male) and at its narrowest point is not or scarcely wider than the facial carina (Text-fig. 15). The proboscis is of very uniform length, never greatly elongate, and the *mentum* has two moderately distinct shapes (Text-figs 12 & 13) which are constant in any genus-group segregate: in one shape the upper and lower edges of the mentum are subparallel seen in profile so that the mentum is not noticeably tapering, and in the other the upper and lower edges seen in profile distinctly converge apically so that the mentum is tapering.

The *antennae* are always very small and their apices fall short of the epistomal margin by a distance about equal to, or only a little less than, their own length; they have no characters of supraspecific value, but the length of the third segment relative to the second sometimes provides a useful specific character. The *palpi* are minute (not longer than third antennal segment or basal thickness of the mentum) in *Prodiaphania* but are well developed, long and slender, in other forms (a little shorter than normal in *Rutilia micropalpis* and in *Chrysopasta*); they are sexually dimorphic in *Chetogaster* (slender in males, spatulate or clubbed in females) but not detectably so in other genera.

#### THORAX, LEGS AND WINGS

The structure of the thorax, legs and wings is extremely uniform and provides very few taxonomic characters. In a few species the posterior part of the notopleuron is produced as a knob-like swelling that is much more prominent than usual, but otherwise the thoraces are alike throughout the tribe. Some forms have slightly more elongate legs and tarsal claws than others, but not in any tangible way that can provide taxonomic characters. The tegula (epaulet) has a pair or more of long wiry setulae on its posterior edge in all Rutiliines except the one species of *Formodexia*. In some forms, especially species of subgenus *Donovanius*, the wing membrane is partially bare along some of the basal cells (at least no microtrichia visible by entomological microscope, although the S.E.M. microscope might prove them to

be present in reduced form), and it appears that this might provide a useful specific character. There are only minute differences in the relative proportions of the costal sectors, but the degree of dilation of the costal base provides a character of minor taxonomic use; some species have the costal base exceptionally strongly flattened and widened (explanate), especially in the male, and the explanate costal bases (i.e. the antecosta of Paramonov) then give the wings the appearance of having basal 'shoulders' which are very easily visible to the naked eye (especially in flies with the wings set back in the resting position). Partial or complete infuscation of the wings occurs in some species, and can provide a helpful specific character. Basicostal colour is also sometimes helpful.

#### ABDOMEN AND GENITALIA

*Abdominal form.* The abdomen is always very robust (Text-figs 28 & 29) and often conspicuously broad and slightly flattened, and the shape is moderately uniform in each genus-group segregate. The shape of T5—if convexly rounded and tapering posteriorly or whether short, very broad and deeply hollowed medially—provides an important character at supraspecific level. The degree to which the sternites are exposed between the approximated ventral ends of the tergites does not seem to provide any helpful characters except at the specific level in *Prodiaphania*. The bilobed *fifth sternite* of the male shows little variation through the tribe as a whole (Text-figs 30–35), the two lobes normally having a simple rounded shape (Text-figs 30 & 31), but an unusual shape of fifth sternite occurs in *Grapholostylum* (Text-fig. 33) and the lobes are straighter than usual apically in *Microrutilia* (Text-fig. 32). In the subgenus *Paramphibolia* each lobe has a small blunt tooth or prong on the inner edge towards the apex (Text-fig. 35), and this form of male fifth sternite occurs nowhere else in the Rutiliini.

*Male genitalia* (Text-figs 36 & 39). The general structure of the male hypopygium is exceedingly constant throughout the Rutiliini and there are really no characters of importance at the supraspecific level; even at the specific level the taxonomic characters are almost confined to the surstyli, with a few useful characters in the cerci and epandrium. The *hypandrium* (sternite 9), *pregonites*, *postgonites* and *epiphallus* (spinus) are virtually identical in every species, and the aedeagus itself has an astonishingly constant form. The only difference observed in the *aedeagus* between different species lies in the *distiphallus*, in which the relative lengths of the proximal sclerotized part and the membranous distal part vary slightly. In the majority of forms the membranous part of the *distiphallus* is about as long as the sclerotized part or a little shorter (Text-fig. 37), but in a very few species (mainly the subgenus *Grapholostylum*) the distal membranous part is unusually elongate and whip-like (nearing twice as long or so as the sclerotized length, as in Text-fig. 38). The *epandrium* (T9) is very large and shows some very minor differences in shape between species, but the differences are rather too intangible to have practical value in taxonomy. The *cerci* are elongate, not fused, and sometimes show differences in shape either in profile or posterior view which are useful for species recognition; they have no features of use for supraspecific characters. The most important structures by

far in the genitalia for taxonomic purposes are the *surstyli*; these show great diversity of shape, ranging from sharply pointed rather hook-like structures to enormous foliaceous lobes. In some groups the surstylus shape may be very constant (e.g. in *Donovanius*) throughout a range of species, but other groups may contain an admixture of species some of which have surstyli differing only by subtleties of outline and others of which have unmistakable surstyli showing some bizarre features. Broadly speaking, however, each genus-group segregate *tends* to show a surstylus shape with some common denominator—for example a surstylus always ending in a sharp tip or always with a subquadrate form.

*Female postabdomen.* This has not been studied in detail, but the examination of the postabdomen from representative females of different genera has not suggested the existence of good characters of value in supraspecific taxonomy. Detailed examination of species within a particular subgenus or genus will almost certainly, however, show up some differences that will enable females to be more reliably determined than at present.

#### KEY TO TRIBES OF THE SUBFAMILY PROSENINAE IN THE ORIENTAL AND AUSTRALASIAN REGIONS

The subfamily Proseninae (=Dexiinae of authors) contains a vast assemblage of Tachinidae that occur in all the zoogeographical regions and subregions (except New Zealand) and appear to be exclusively parasites of beetles. If certain aberrant fringe genera are excepted the Proseninae as a whole has a facies which—in spite of great diversity in body shape and the degree of development of a facial carina—specialists on Tachinidae can recognize, even if they find it hard to pin down exactly what the diagnostic characters of the subfamily really are; certainly the form of the male aedeagus and its associated structures seems to provide some common denominator throughout the group. At present there is no available recent definition of the Proseninae, and the welter of world forms to be considered will make it difficult to arrive at a satisfactory definition that will work on a world basis. Likewise the completely satisfactory delimitation of tribal groupings within the subfamily will not be easy, and Townsend's various tribes in his *Manual of Myiology* need a thorough revision. In these circumstances I am not attempting here to provide a definition of the subfamily Proseninae, but I nevertheless think it useful to indicate the tribal entities which seem to justify recognition in the fauna of the Oriento-Australasian regions (in the area to which the Rutiliini are confined); an attempt will be made in a later work on the Tachinidae of New Guinea to elaborate complete diagnoses of the tribes and of the Proseninae as a whole.

The three tribes recognized in the Oriental and Australasian fauna are the Prosenini, Doleschallini, and Rutiliini, which can be distinguished by the following key.

- 1 Thorax closed above the hind coxae by a broad sclerotized bridge (as in *Cylindromyiini*), the hind coxae remote from the abdominal base. Head in profile subtriangular, profrons extraordinarily prominent and lower part of head strongly receding, head very much longer at antennal axis than at epistomal axis. No

facial carina. Notopleuron not differentiated from prescutum by any depression. Abdominal T1 + 2 excavate only at base. Body and legs excessively long and slender, the long thin abdomen with subparallel sides. [Ceylon, Indonesia to Solomon Islands, unknown from Australia] . . . . . Tribe **DOLESCHALLINI**

[Type-genus: *Doleschalla* Walker, 1861]

- Thorax membranous or mainly so between bases of hind coxae and abdominal insertion, coxae and abdomen usually not remote from each other. Head in profile not subtriangular, at most only slightly shorter at the epistomal axis than at the antennal axis, often with epistome at least as prominent as profrons. Head usually with facial carina (absent in some forms). Notopleuron distinctly differentiated from prescutum by a groove or at least a shallow depression. Excavation of abdominal T1 + 2 reaching to hind margin. Body form often robust, if long and slender then abdomen broadest near base or subfusiform . . . . . 2
  - 2 Postalar callus with only the normal two strong setae (at most only a short weak setula in addition). Suprasquamal ridge and postalar wall bare. Epistome not produced in front of vibrissae or only weakly so, not readily visible in profile. Propleuron bare or haired. Barete bare or with a few hairs anteriorly (if all haired then no facial carina). Facial carina present or absent. Scutellum with three pairs of marginal setae. Male hypopygium without long strong erect setae on T7 + 8 except in *Acucera*. Prosternal membrane and prosternum bare. Arista often very long-plumose. [nearly cosmopolitan] . . . . . Tribe **PROSENINI**
- [Type-genus: *Prosenia* Lepeletier & Serville, 1828]
- Postalar callus with supernumerary strong setae, total of 3-6 setae (except in *Chetogaster*<sup>1</sup>). Either suprasquamal ridge or postalar wall usually haired. Epistome subnasute or at least slightly and distinctly projecting in front of vibrissae in profile. Propleuron haired (*very* rarely bare in isolated specimens). Barete thickly haired along its length (partially bare in *Chetogaster*<sup>1</sup>). Strong facial carina present. Scutellum with four or more pairs of marginal setae (except in *Chetogaster*<sup>1</sup>). Male hypopygium with long strong erect setae on T7 + 8 (usually standing in line on each side of tergite). Prosternal membrane, or membrane and prosternum itself, sometimes haired. Arista micropubescent to short-plumose (never very long plumose). [Oriental and Australasian Regions (except New Zealand)] . . . . . Tribe **RUTILIINI**
- [Type-genus: *Rutilia* Robineau-Desvoidy, 1830]

### Tribe **RUTILIINI** Brauer & Bergenstamm

**RUTILIAE** Swainson in Swainson & Shuckard, 1840 : 377. Generic plural unavailable as family-group name (Article 11 (e) (i) of *International Code of Zoological Nomenclature*, 1961). **RUTILIIDAE** Brauer & Bergenstamm, 1889 : 76, 152. Type-genus: *Rutilia* Robineau-Desvoidy, 1830.

**AMPHIBOLIIDAE** Brauer & Bergenstamm, 1889 : 76, 152. Type-genus: *Amphibolia* Macquart, 1843.

**ROEDERIIDAE** Brauer & Bergenstamm, 1889 : 76, 152. Type-genus: *Roederia* Brauer & Bergenstamm, 1893 [= *Chrysopasta* Brauer & Bergenstamm, 1889], junior homonym of *Roederia* Mik, 1881.

**SENOSTOMATINI** Townsend, 1932 : 40; Townsend, 1936 : 20, 154; Townsend, 1938 : 424. Type-genus: *Senostoma* sensu Townsend, not Macquart [misidentification] [= *Prodiaphania* Townsend]. **SENOSTOMINI** Enderlein, 1936 : 397, 435.

**AGALMIINI** Enderlein, 1936 : 397, 433. Type-genus: *Agalmia* Enderlein, 1936 (junior

<sup>1</sup> This genus is rather intermediate between Rutiliini and Prosenini but is here retained in its traditional position in Rutiliini.

homonym of *Agalmia* Enderlein, 1934) [= *Grapholostylum* Macquart, 1851, by subjective synonymy of type-species].

**HABROTINA** Enderlein, 1936 : 398 (subtribe). Type-genus: *Habrota* Enderlein, 1936 [= *Chrysorutilia* Townsend, 1915, by junior objective synonymy].

**DIAGNOSIS.** Facial carina well developed, usually broadly separating antennae. Antennae small, often falling short of mouth-margin by more than their own length; arista micropubescent to short-plumose. Epistome projecting at least slightly, usually very strongly and sharply, in front of vibrissae in profile, about as prominent as or more prominent than profrons. Vibrissae often reduced. Eyes bare, head in ♂ sometimes nearly holoptic. ♂ frons narrower than ♀ frons; proclinate orbital setae always absent in ♂, weak or absent in ♀. Proboscis short, not longer than head; mentum in profile parallel-sided or slightly tapering. Scutal chaetotaxy variable, often reduced. Scutellum, venter of sternopleura and mid and hind coxae often with stiff spiniform setae. Prosternal membrane (in *Chrysorutilia* anterior angles of prosternum also) sometimes haired. Propleuron haired (very rarely bare in isolated specimens). Barette usually fully haired. Infrascapular setulae absent (except in some *Chetogaster* species). Postalar callus with 3-6 strong setae (except only two in *Chetogaster*). Postalar wall sometimes haired. Presutural intra-alar setae absent, 0-3(4) *post ia* setae. Suprascapular ridge bare or haired. Lower calyptrae broad and abutting close to scutellum. Wing node with small inconspicuous setulae above and below, wings otherwise bare. Second costal sector bare below. Cell  $R_5$  open. Bend of vein *M* without appendix, very close to wing margin. Vein *Sc* meeting costa just basad of or level with *r-m*. Wings often with large dark area over basal cells. Abdomen very large, broad and widest near base, posterolateral corners often very prominent and  $T_5$  then often with median depression;  $T_1 + 2$  excavate to hind margin. Abdominal chaetotaxy often spiniform.  $T_1 + 2$  without median marginal setae.  $T_7 + 8$  of ♂ hypopygium with a group of long strong setae (usually 3 or 4 standing in line) on each side. Medium-sized to very large flies (length 6-22 mm), often brightly coloured and metallic or with conspicuous patterning.

**IMMATURE STAGES AND BIOLOGY.** Parasitic in large soil-inhabiting white grub larvae of Scarabaeidae (Melolonthinae, Rutelinae, Dynastinae) and in rotten-wood inhabiting larvae of Lucanidae: probably also parasitizing other related Scarabaeoid beetles. Eggs medium macrotype, slender, elongate and slightly bowed with rounded ends (Townsend, 1942, plate 21, figs 146 & 147). Habit larviparous; uterus enlarged, capacity of many hundred first stage larvae, these active and deposited on soil-surface. Stage I larva slender, elongate, with long terminal hairs, sometimes also some marginal segmental hairs; stage II larva unknown; stage III larva swelling towards posterior end, segmentation distinct, cuticle (in one species known) with covering of short colourless stubby hairs, posterior spiracles in form of very large slightly separated plates either flush with posterior surface or slightly sunken, plates perforated by very numerous minute pores or sinuate micro-slits, outer rim of plates thickened, button subcentral. Puparium (of the few known forms) with sunken posterior spiracles and covering of micro-hairs. Adult flies absent from desert areas, present in scrub or forest, settling on tree-trunks, posts, or underside of leaves in rain forest, females resting on ground only when larvipositing; attracted to flowers, notably *Eucalyptus*.

**DISTRIBUTION.** Widespread throughout, and confined to, the Oriental and Australasian zoogeographical regions (map, p. 163), but especially abundant in Australia. In Oriental Region occurring through south-east Asia from Ceylon and India to Philippines and Indonesia; in Australasian Region occurring in Australia

and Tasmania, Moluccas, Timor, Aru Islands, Kai Islands, New Guinea, Solomon Islands, New Hebrides, Fiji, Samoa, and Lord Howe Island. Unrecorded from New Caledonia, but probably occurring there. Absent from New Zealand.

**DISCUSSION.** Since the time of Brauer & Bergenstamm (1889) specialists in the Tachinidae have been agreed in regarding the Rutiliines as a named family-group segregate distinct from other Proseninae (=Dexiinae of authors), though the group has been variously ranked as a tribe, subfamily, or even occasionally as a family, and sometimes has even embraced the Ameniines—a curious group of calyptrate flies with an astonishing superficial likeness to the Rutiliines but now accepted as a subfamily of Calliphoridae (Crosskey, 1965). It is unnecessary here to review all of the varying interpretations of status and scope of the group, but the few major works of the past 35 years require brief consideration.

Townsend (1936) treated the one family Tachinidae, as currently accepted, as being seven families, of which the Rutiliidae were a small family on their own, placed between the Prosenidae and the Tachinidae in Townsend's narrow sense (Townsend, 1936 : 20, 150–156; 1938 : 410–427); Townsend's families are, however, very unsatisfactorily defined, and his family key has 84 exits (of which three are to Rutiliidae) for the separation of seven families. One of the exits to Rutiliidae in the key (Townsend, 1936 : 8) relates to those Rutiliines which have the suprasquamal ridge (=tympanic ridge of Townsend) haired, and there is never any problem in distinguishing these forms from all other Tachinidae: but it is much more difficult in defining the Rutiliines to take account of the forms which, though obviously Rutiliines also, have the suprasquamal ridge bare—for the characters of the Rutiliines as a whole then merge rather imperceptibly with those of the Prosenines (Prosenidae of Townsend). For this reason it is impossible to separate the Rutiliines from the Prosenines so distantly as to rank the groups equally (as Townsend does), and it is much better therefore to treat the Rutiliines as being a subgroup within the Prosenines (Dexiines of authors).

This view was well expressed by Mesnil (1939), in his general essay on Tachinid classification, as he divided the subfamily Dexiinae (Proseninae) into two tribes, Rutiliini and Dexiini (Prosenini), distinguishing the former from the latter by the prominent mouth-margin together with a few other less tangible features. My own view is very much in accord with that of Mesnil (1939), both as regards the affinities and ranking of the Rutiliines, and is elaborated in more detail in the following discussion (in which I have used the currently accepted names Proseninae and Prosenini in place of Dexiinae and Dexiini as used by many authors).

The vast complex of diverse forms which constitute the subfamily Proseninae is exceedingly hard to classify satisfactorily at any level, and almost any constellation of characters which appears to be satisfactory for defining a genus-group or family-group taxon when only a small collection or a limited regional fauna is available tends to become almost worthless for taxon definition when a comprehensive collection of worldwide forms is studied. Yet so great is the number of forms to be coped with that some segregation of family-group categories is needed, even if these are difficult to define in a fully satisfactory way and even if some genera are hard to

place into a subtribe or tribe with any confidence. Considering the whole of the Proseninae there is no doubt that the great bulk of forms constitute one very large tribe (Prosenini) containing much variety of form but united by all perceptible shades of intermediate characters, but that there are some other large groups or small groups that are more disjunct from the main body of forms and which can justifiably be ranked as tribes equivalent to the Prosenini; these include the Rutiliini, Doleschallini and Trixini, and perhaps a few other definable tribes when sufficiently studied. The Theresiini, Dexillini and Zeliini which Townsend (*Manual of Myiology*) treated as distinct tribes appear to me to be indistinguishable from Prosenini, and I am also doubtful whether the Trichodurini can be separated from the Prosenini either. The position of the subtribe Stominina of Mesnil (1939 : 52-53) is also very doubtful, but in my view it has scarcely any of the characters of the Rutiliini and cannot be placed in the Rutiliines where Mesnil has classified it: the characters of *Stomina* Robineau-Desvoidy appear to place this genus close to *Billaea* Robineau-Desvoidy in the Prosenini. At present the various tribal segregates within the Proseninae are insufficiently clarified, but the diagnosis here given should certainly distinguish the Rutiliini satisfactorily from all other Proseninae (except perhaps for the anomalous genus *Chetogaster*), and the key given in a foregoing section will separate the tribe from other tribes of Proseninae found in the Oriento-Australasian regions.

Although the Rutiliines have been so widely accepted as a family-group segregate, and are here ranked as a tribe on their own, it is impossible to characterize them as a whole by any simple character or small group of characters in a way that absolutely defines them. The best diagnostic feature (though it does not hold for the genus *Chetogaster*) is the presence of supernumerary strong bristles on the postalar callus; in all other Proseninae (and virtually all Tachinidae) there are only two strong setae on the postalar callus, sometimes accompanied by a long hair, but in all Rutiliini (excepting *Chetogaster*) there are at least three very strong postalar setae and sometimes from four to six. Another important character is the snout-like development of the epistome, which projects far in front of the vibrissae in profile (as mentioned by Mesnil, 1939), but some *Formosia* and *Rutilodexia* have the epistome only very slightly projecting, and resemble many Prosenines in this respect, so that this character, too, is not completely satisfactory. Many Rutiliini have the supra-squamal ridge thickly haired and others have a tuft of long hair standing on the wall of the postalar callus, and these features are never found in other Proseninae. The facial carina is always very strong in Rutiliini, and often very wide and flattened (then assuming a form almost never found among other Prosenines), and many members of the tribe have very strong erect spiniform setae on the abdomen or long strong spiniform setae on the scutellum and mid and hind coxae; such spiniform setae are of rare occurrence in other Proseninae, although they are found in several South American genera and in the Nearctic genus *Euchaetogyne* Townsend, but the New World forms which slightly resemble Australasian Rutiliini can always be easily distinguished by possessing only the two normal setae on the postalar callus and usually by having the propleuron bare (though in *Euchaetogyne* the propleuron is haired, as in the Rutiliini). The males of all Rutiliini have some very characteristic long strong bristles on tergite 7 + 8 of the hypopygium, these bristles standing in

two groups separated medially and normally consisting of three or four such setae standing in a transverse line on each side; long strong setae of this kind on T7 + 8 almost never occur in other Proseninae, though similar setae are found in the European genus *Deximorpha* Rondani and the Australian genus *Acucera* Malloch.

Enderlein (1936) divided the Rutiliines, which in his treatment ranked as a subfamily, into five tribes (of which two tribes are Ameniines), and Townsend (1936, 1938) divided his Rutiliidae into two tribes, but both of these workers are renowned for their taxonomic 'splitting' and later workers have, rightly in my view, declined to accept any validity for these tribes; nor have the many ill-defined and unnecessary genera erected by Enderlein (1936) been accepted (Paramonov, 1968 : 351, has pointed out that they are unwarranted, and often misleading because of misidentification of the type-species, and I agree entirely with Paramonov's view). In the present work no subtribes are recognized, and the scope of the Rutiliini is very similar to that shown by Paramonov (1968), except that the genera *Ola* Paramonov, 1968, and *Ruya* Paramonov, 1968 (of which the type-species and several other included species have been examined) are excluded: the facies of *Ola* and *Ruya* are not at all those of Rutiliini, both possess three strong *post ia* setae (such as rarely occur in Rutiliines), the conformation of the flat face is quite unlike Rutiliines, and there are many other features on which *Ola* and *Ruya* must be excluded from the tribe. It should be noted that Paramonov (1968 : 381) was himself doubtful about the inclusion of these genera in Rutiliini.

Paramonov (1968 : 350-352) has given an historical review of the description of Rutiline genera, which need not be repeated here. Up to now 38 generic and subgeneric names have been proposed for Rutiline flies, most of which are nomenclaturally available though many of them are considered taxonomically invalid in Paramonov's (1968) treatment and in the present work. Two names published by Paramonov (1968), viz. *Formotilia* and *Rutilosia*, are unavailable under Article 13 (b) of the *International Code of Zoological Nomenclature* because there is no fixation of a type-species for either genus. The names *Diaphania* Macquart, *Roederia* Brauer & Bergenstamm, *Agalmia* Enderlein and *Eucompsa* Enderlein are preoccupied homonyms, and the replacement name *Prodiaphania* Townsend is available for the first of these; the others are synonyms and do not require replacement names. The name *Eucompsa* Enderlein, 1936, in Rutiliini was proposed by Enderlein (1936 : 400) as a new genus, with *Rutilia minor* Macquart cited as type-species, although Enderlein had himself already erected the genus *Eucompsa* Enderlein, 1922, in Tabanidae, and *R. minor* was already type-species of *Microrutilia* Townsend: thus in one name Enderlein achieved the feat of publishing a junior objective synonym (of a Townsend genus) and a junior homonym (the latter of one of his own names)!

In the present re-classification of the Rutiliini I recognize the following eight genera: *Formosia* Guérin-Ménéville, *Rutilodexia* Townsend, *Formodexia* gen.n., *Rutilia* Robineau-Desvoidy, *Amphibolia* Macquart, *Chrysopasta* Brauer & Bergenstamm, *Prodiaphania* Townsend, and *Chetogaster* Macquart. Three of these are divided into subgenera, three subgenera being recognized in *Formosia*, seven in *Rutilia* and two in *Amphibolia*.

A detailed study of the male genitalia throughout the tribe has shown that there

are no characters that can be used at the generic level (although differences in the shape of the surstyli and cerci can be very important in distinguishing species) and genera have to be characterized by externally visible features. Some of the genera are moderately distinctive and can be satisfactorily diagnosed, but others need to be characterized by aggregates of several features taken together (even then they may have to include species which clearly fit them on total facies but which fail to conform to one or more of the normal generic characters). It has to be borne in mind when using the keys that almost any character can fail in an occasional specimen.

### KEY TO THE GENERA OF RUTILIINI

[Note: Tasmania is treated as part of Australia and is not separately cited in the geographical information.]

- 1 Suprasquamal ridge bare (Text-fig. 21). Prosternal membrane bare . . . . . 2
- Suprasquamal ridge haired (Text-figs 23 & 24). Prosternal membrane bare or haired (Text-fig. 18) . . . . . 7
- 2 Palpi minute, not longer than basal width of mentum and not longer than third antennal segment. Buccal opening very long and narrow (Text-fig. 15), at narrowest point not wider than facial carina. Arista conspicuously short-plumose. Upper parts of parafacials haired. Upper calypter enlarged, when wings folded usually as long as lower calypter. [Australia only]

#### **PRODIAPHANIA** Townsend (p. 107)

- Palpi well developed, very much longer than either basal width of mentum or third antennal segment. Buccal opening wide (Text-fig. 14), much broader than facial carina (except in *Formodexia*). Arista pubescent or occasionally with very short plumosity. Parafacials entirely bare (some exceptions). Upper calypter normal . . . . . 3
- 3 Postalar callus with two strong setae (sometimes with one very much shorter and finer setula in addition differentiated from hair). Epistome subnasute, facial profile deeply excavate between epistome and carina (Text-fig. 8). Palpi sexually dimorphic, distinctly clubbed or spatulate in ♀ and slender in ♂. Infrsquamal setulae often present. Scutellum normally with only three pairs of marginal setae, at most with four (including the apical pair). [Australia only]

#### **CHETOASTER** Macquart (p. 112)

- Postalar callus with three or more strong setae. Epistome not very strongly prominent, facial profile usually only slightly concave between epistome and carina (Text-fig. 4). Palpi not sexually dimorphic, long and slender in both sexes (at most only trace of swelling at extreme tip). Infrsquamal setulae absent. Scutellum normally with 4-11 pairs of marginal setae (including apical pair), very rare specimens with only three pairs . . . . . 4
- 4 Apical scutellar setae inserted at the same level as the other scutellar marginal setae (Text-fig. 11). Postalar wall with dense hair tuft (Text-fig. 25). Ventral margins of abdominal tergites with very strong spiniform setae directed downwards. Head often partly metallic. ♂ head sometimes holoptic or almost so. [Java to Solomon Islands, Australia]

#### **FORMOSIA** Guérin-Ménéville (p. 25)

- Apical scutellar setae inserted at a conspicuously lower level than the other scutellar marginal setae (Text-fig. 10). Postalar wall without dense hair tuft (except in *Formodexia*). Ventral margins of abdominal tergites without such vestiture, if marginal setae slightly spiniform then directed backwards as well as downwards. Head non-metallic. ♂ head never holoptic . . . . . 5
- 5 Postalar wall with dense hair tuft. Buccal opening very narrow, in ♂ scarcely at all

wider than facial carina. Tegula without long fine wiry setulae. Palpi exceptionally long and slender. Costal base explanate and with very long dense fringe (wings in folded position therefore appearing to have strongly developed 'shoulders'). [Moluccas only]. . . . . **FORMODEXIA** gen. n. (p. 38)

- Postalar wall without hair tuft, normally entirely bare (few specimens with a few hairs on extreme upper part adjacent to the dorsolateral ridge of the postalar callus). Buccal opening broad, very much wider than facial carina in both sexes. Tegula with normal long fine wiry posterior setulae. Palpi normal. Costal base not explanate (wings in folded position without appearance of prominent 'shoulders'). [Not from Moluccas] . . . . . 6
- 6 Genal dilation small, only extending forwards for about half the length of the genal region and not as far as the most anterior point of the eye (Text-fig. 5). Proboscis with slender mentum that is conspicuously tapering in profile (Text-fig. 13). Postalar callus with 4-6 setae and body without white pollen spots on sides of thoracic dorsum and the abdomen. Wing membrane distinctly tinged with brown or yellowish brown. [New Guinea, New Britain, Aru Islands]

**RUTILODEXIA** Townsend (p. 40)

- Genal dilation well developed, reaching forwards for obviously more than half the length of the genal region and as far as the most anterior point of the eye (Text-fig. 4). Proboscis with broader mentum in which sides subparallel in profile (Text-fig. 12). Postalar callus with either three strong setae only or with 4-5 setae and body with white pollinose spots on thorax and abdomen. Wing membrane (except for basal dark mark) clear hyaline or almost so. [Australia]

**RUTILIA** Robineau-Desvoidy (a few forms)

- 7 Dorsum of thorax with four broad bold black vittae which are interrupted at the transverse suture, appearing therefore to have eight elongate black spots (four on prescutum and four on scutum). Palpi much shorter than mentum. Postorbital with alternating silvery white and black spots which shift in appearance with direction of light. Facial carina strongly bulbous on upper part and strongly contracted with sharp median ridge on lower part. Parafacial hairing reaching below the lowest point of the eye and virtually continuous with hairing on genal dilation. [Western Australia only]

**CHRY SOPASTA** Brauer & Bergenstamm (p. 102)

- Dorsum of thorax without such pattern. Palpi as long or almost as long as mentum. Postorbital without pattern of alternating white and black areas. Facial carina broad and flattened on anterior surface with subparallel sides, or widened above and contracted ventrally (in latter case not normally formed into very narrow sharp ridge). Parafacials bare or haired, but if haired the hairing not normally extending below lowest point of eye in profile and well separated by conspicuous bare area from hairing on the genal dilations . . . . . 8

- 8 Intermediate abdominal tergites (T<sub>3</sub> and T<sub>4</sub>) without discal setae. Facial carina usually very broad and flattened, often slightly sulcate, with subparallel sides, at most only a little knob-like dorsally and contracted ventrally. Abdomen without bold black-and-white pattern (rare exceptions). Forms often with partly metallic head or with deep median depression in abdominal T<sub>5</sub>. [Widespread in Oriental and Australasian Regions] . . . . .

**RUTILIA** Robineau-Desvoidy (most forms) (p. 42)

- Intermediate abdominal tergites (T<sub>3</sub> and T<sub>4</sub>) with discal setae (lacking in occasional specimens on one or other of these tergites, very rarely on both; if absent then abdomen with bold black-and-white pattern). Facial carina widest dorsally between junctions of second and third segments of the antennae and conspicuously narrowed ventrally, not subparallel-sided and not flattened on anterior face. Abdomen most often with bold black-and-white pattern. Head never metallic, completely pollinose, and abdominal T<sub>5</sub> without wide median depression. [New Guinea, Australia and Lord Howe Island] . . . . . **AMPHIBOLIA** Macquart (p. 93)

Genus **FORMOSIA** Guérin-Ménéville

*Formosia* Guérin-Ménéville, 1843 : 263. Type-species: *Rutilia mirabilis* Guérin-Ménéville 1831, by monotypy.

**DIAGNOSIS.** Facial carina large, widening ventrally or with subparallel sides, at most only slightly widened medially. Epistome usually not strongly prominent. ♂ head holoptic or nearly so, eyes always strongly approximated, upper eye facets sometimes conspicuously enlarged and set off from small lower facets. Parafacials always bare. Buccal opening normal, if somewhat narrowed then conspicuously wider than facial carina. Genal dilation well developed, usually not reaching forward as far as front level of eye. Head often partly metallic. Arista pubescent or short-plumose. Palpi normal. Prosternum and prosternal membrane bare. Scutellum with apical setae at same level as, and not readily distinguishable from, other marginal setae; marginal setae stiff and straight, normally at least five pairs; disc of scutellum often markedly flattened. Postalar callus with 3-5 strong setae. Postalar wall with dense hair tuft. Suprasquamal ridge bare. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate. Abdomen with stout spiniform setae directed downwards on ventral margins of tergites; T<sub>3</sub> with median transverse row of spiniform marginal setae (except in males of most *Euamphibolia* spp.); intermediate tergites without discal setae. T<sub>5</sub> short and broad, usually with well formed median depression and prominent posterior corners.

**DISTRIBUTION.** From Java to Solomon Islands and Queensland, one species (see *Euamphibolia*) reaching to Tasmania and Western Australia; especially well represented in Moluccas, New Guinea and Bismarck Archipelago. Unknown from Philippine Islands and possibly absent.

**DISCUSSION.** This is the predominant genus of Rutiliini in the Papuan subregion and contains many large and attractive species of beautifully patterned and metallic flies which often have a brilliant golden green to violet-blue coloration; the general appearance, both of shape and colour patterns, resembles that of many *Rutilia* species, and *Formosia* and *Rutilia* are without doubt very closely allied genera. Despite the superficial resemblance, *Formosia* is easily distinguished from *Rutilia*, and from all other genera of Rutiliini here recognized (except *Formodexia* gen.n.) by the presence of a thick tuft of long hair on the side wall of the postalar callus (Text-fig. 25). This is a remarkable and very unusual character which, to the best of my knowledge, does not occur elsewhere in the Tachinidae, and in the Rutiliini is confined to *Formosia* and *Formodexia* (though occasional specimens of *Rutilodexia* and *Rutilia* s.l. may have a very few hairs on the extreme upper edge of the postalar wall adjacent to the postalar rim). The features distinguishing *Formosia* from *Formodexia* are discussed under the latter genus, and a tabulation of the main differences between *Formosia* and *Rutilia* s.l. is given in the treatment of *Rutilia*.

Six genera have been described in the Rutiliini which are here considered not to be generically distinguishable from *Formosia*. These are *Pseudoformosia* Brauer & Bergenstamm, *Euamphibolia* Townsend, *Chromocharis* Enderlein, *Hega* Enderlein, *Laccura* Enderlein and *Pancala* Enderlein. Two of these names, however, apply to rather well defined segregates within *Formosia* s.l. which it is thought useful to recognize as subgenera, as these subgenera (viz. *Pseudoformosia* and *Euamphibolia*) can be defined by quite constant structural features which are associated with rather conspicuous differences in general facies and pattern. The other four names (all

provided by Enderlein in his usual lavish way) are treated as unnecessary synonyms applying to concepts for which older genus-group names are available: *Chromocharis* and *Hega* are placed as synonyms of *Euamphibolia*, *Laccura* as a synonym of *Pseudoformosia*, and *Pancala* as a synonym of *Formosia* s.str.

The male genitalia and fifth abdominal sternite in *Formosia* s.l. call for no special comment as they differ in no significant way from those of other Rutiliini or Proseninae in general. The shape of the surstyli (paralobes) is more square and 'heavy' in the subgenus *Euamphibolia* than in the other subgenera of *Formosia*, and males of this subgenus are therefore rather distinctive.

#### KEY TO THE SUBGENERA OF *FORMOSIA*

- 1 Postalar callus with 4-5 strong setae. One *post ia* seta (rarely none). Eyes of ♂ very strongly approximated or meeting, upper part of frons narrower than facial carina. Upper eye facets of ♂ often greatly enlarged. Head partly metallic (a few exceptions). No posthumeral setae. Mentum in profile normally rather slender and distinctly tapering (Text-fig. 13). Surstyli of ♂ genitalia of varied form but normally tapering on apical half and not subquadrate (Text-figs 41-44) . 2
- Postalar callus with three strong setae. 2-3 *post ia* setae (sometimes very weak fourth seta). Eyes of ♂ not very strongly approximated, never meeting, frons at narrowest at least as wide as and normally wider than the facial carina. Upper eye facets of ♂ not enlarged. Head non-metallic, entirely pollinose. Small posthumeral seta normally distinguishable among the prescutal hairing. Mentum in profile not unusually slender, upper and lower edges subparallel (Text-fig. 12). Surstyli of ♂ genitalia very heavy and subquadrate in profile (Text-figs 52 & 53)  
**EUAMPHIBOLIA** Townsend (p. 33)
- 2 Anterior surface of fore coxa almost completely haired (Text-fig. 16). One sternopleural seta (0 + 1). Presutural dorsocentral setae absent. Abdominal T5 without long strong setae behind the main transverse row  
**FORMOSIA** Guérin-Ménéville s.str. (p. 26)
- Anterior surface of fore coxa bare on inner half, except near apex (Text-fig. 17). Two sternopleural setae (1 + 1). At least one small presutural dorsocentral seta present on each side of prescutum, though sometimes very weak. Abdominal T5 with or without long strong setae behind the main transverse row  
**PSEUDOFORMOSIA** Brauer & Bergenstamm (p. 31)

#### Subgenus *FORMOSIA* Guérin-Ménéville

*Formosia* Guérin-Ménéville, 1843 : 263. Type-species: *Rutilia mirabilis* Guérin-Ménéville, 1831, by monotypy.

*Pancala* Enderlein, 1936 : 422. Type-species: *Formosia callipygos* Gerstaecker, 1860, by original designation. **Syn. n.**

**DIAGNOSIS.** Head metallic, at least in some lights, on postorbital, genal dilation, parafrontals and usually also upper parafacials (except in *viridiventris* sp. n.). Head of ♂ holoptic or nearly so, upper interfrontal area obliterated or nearly so by meeting parafrontals, frons at its narrowest point not as wide as facial carina. Upper facets of ♂ eyes often much enlarged, ocelli then very prominent. Arista shortly plumose, hairs longer than basal thickness of arista. Mentum of proboscis rather slender, tapering distally. No posthumeral setae. No presutural dorsocentral setae. One strong *post ia* seta. One sternopleural seta (0 + 1). Postalar callus with 4-6 setae. Scutum often with supernumerary strong prescutellar setae between the hindmost *post acr* and *post dc* setae, the setae together forming a transverse prescutellar row. Disc of

scutellum usually conspicuously flattened. Fore coxa almost completely haired on anterior surface. Transverse row of erect median marginal setae of T<sub>3</sub> present in both sexes. T<sub>5</sub> without strong setae behind the transverse row (a few exceptions).

**DISTRIBUTION.** Occurring from Malaya and Java eastwards to the Solomon Islands, and known from Selangor, Java, Celebes, Molucca Islands (including Halma-hera, Ternate, Batjan, Morotai, Obi, Seram), New Guinea, Aru Islands, New Britain, New Ireland, Lavongai, Bougainville, and the major islands of the Solomons chain south-east to Guadalcanal. Unknown from Philippine Islands (possibly not represented there), absent from Australia.

**DISCUSSION.** *Formosia* s.str. is the largest subgenus in number of described species (and several additional undescribed species are known from the New Guinea area) and contains most of the brilliant metallic forms of Rutiliini that form such a characteristic element in the Tachinid fauna of the Papuan subregion. The subgenus is easily distinguished by the extensively haired fore coxae, in which almost all of the anterior surface is haired (Text-fig. 16), an unusual feature found nowhere else in the Rutiliini; in other Rutiliines, as in most Tachinidae, the inner half of the anterior surface of each fore coxa is almost entirely bare (there being only a few hairs towards the tip). The one sternopleural seta and the one posterior intra-alar seta, together in correlation, also uniquely distinguish *Formosia* s.str. from the other subgenera. A rather unusual character, too, though occurring in some other Rutiliini, is the slender tapering proboscis, and the strongly flattened scutellum of most forms is another feature exceptional among Rutiliini as a whole.

*Formosia* s.str. is especially well represented in the lowland rain forests of New Guinea and the Bismarck islands, where some species are common at times, but a few species also occur in small patches of relict forest in the New Guinea highlands. Adult flies can often be found resting on low herbage, especially on the undersides of the leaves of wild ginger and similar plants, but nothing is yet known of the host relations (almost certainly, however, Scarabaeoid beetles are the hosts).

Nearly all the species of *Formosia* s.str. form a rather homogeneous group having characters closely similar to those of the type-species, *F. (F.) mirabilis*, but a new species (described herein) from Guadalcanal, in the Solomon Islands, is rather disjunct from the main body of species—although it fits *Formosia* s.str. well in all essential characters—and is here treated as a group of its own. The two groups recognized are keyed and defined below.

#### KEY TO THE SPECIES-GROUPS OF *FORMOSIA* s.str.

- 1 Abdominal T<sub>5</sub> with some long strong erect setae laterally behind the transverse row.  
Head entirely thickly pollinose, nowhere metallic. Surstyli of ♂ genitalia in profile strongly acuminate and ending in sharp point (Text-fig. 49), the whole surstylus somewhat hook-like . . . . . *viridiventris*-group (p. 28)
- Abdominal T<sub>5</sub> without strong setae behind the transverse row of setae. Postorbital and genal dilations, sometimes also parafrontals and upper parafacials, metallic. Surstylus of ♂ genitalia not of this form, always rounded at tip (Text-figs 41-44) . . . . . *mirabilis*-group (p. 29)

THE *VIRIDIVENTRIS*-GROUP

DIAGNOSIS. Facial carina unusually narrow, in facial view subequal in width to an antenna. Head entirely pollinose, no bare metallic areas. Thorax and abdomen unicolorous dark green, no pattern. Abdominal T5 with some long strong setae laterally behind the transverse row of setae. Surstylus of ♂ genitalia sharply pointed (Text-fig. 49).

## INCLUDED SPECIES

*Formosia (Formosia) viridiventris* Crosskey sp. n. GUADALCANAL. [Described below].

*Formosia (Formosia) viridiventris* sp. n.

(Text-fig. 49)

♂. *Head*. Ground colour blackish, except upper part of facial carina and lunula more reddish brown, interfrontal area velvety black-brown; head rather thickly yellowish white pollinose, nowhere metallic but trace of greenish colour showing through pollinosity along lines of postocular setulae. Parafrontal and genal hair blackish, occipital hair yellowish white. Eyes strongly approximated but head not holoptic, upper facets not enlarged, upper part of interfrontal area almost eliminated by coming together of parafrontals in mid line; frons at narrowest point 0.06–0.075 of head width, subequal to width of facial carina. Ocelli slightly raised, ocellar setae weak hair-like. Facial carina long, very slightly fusiform, longer than the epistome, facial profile only very slightly and evenly concave at junction of epistome and carina. Gena broad, 0.33–0.38 of eye-height. Parafacial about twice as wide as third antennal segment. Antennae dark reddish brown to blackish brown, more orange at junction of second and third segments, falling short of mouth-margin by about length of third segment; third segment 2.6–3.0 times as long as second segment; arista very short plumose. Palpi dark brown or dark reddish brown with slightly paler tips. Mentum tapering, rather slender. *Thorax*. Unicolorous very dark green or bluish green metallic, sometimes with violaceous tinges. Prescutum in some lights showing trace of four narrow blackish vittae and thin covering of whitish pollinosity, but these so inconspicuous that prescutum appears concolorous metallic greenish with the scutum. Thoracic hair all black except for postalar tuft pale yellow and the sparse hairing of the propleura yellowish white. Chaetotaxy normal, setae not markedly spiniform. Scutellum not flattened; with four pairs of strong marginal setae, these usually immediately preceded by some moderately strong horizontal preapical setae. *Wings*. Basicosta dark yellowish brown or reddish brown darkened to blackish brown anteriorly. Wing membrane pale smoky brownish with darker brown infuscation along the veins; infuscation conspicuous to naked eye and appearing more yellowish brown basally. Calyptrae dark brown with brown marginal hair. *Legs*. Black with entirely black hair; rather elongate and slender with femora attenuate on apical halves. Fore coxa fully haired anteriorly; mid femur without or with one *a* submedian seta; hind tibia with one strong *ad* seta, without *ad* fringe and without *pd* setae. Claws very long. *Abdomen*. Dorsum concolorous with thorax, uniformly metallic dark green or dark bluish green, venter violaceous towards the sides. Abdominal hairing entirely black; hair short, fine, and recumbent. Six setae in the transverse marginal row of T3. T5 with some long strong setae standing among the hair on each side behind the setae of the main transverse row. Depression of T5 deep and conspicuous. T7 + 8 of hypopygium with only one or two long fine setae on each side, and these not very clearly differentiated from the hair vestiture. Genitalia (Text-fig. 49) with apical part of surstylus very strongly contracted, curved forwards and sharply pointed at tip (somewhat hook-like when seen in profile). *Measurements*. Body length 16.7–18.3 mm (mean 17.5 mm), wing length 14.7–16.5 mm (mean 15.6 mm) [4 specimens, holotype with minimum lengths indicated].

♀. Extremely similar to ♂ except for usual sexual differences. Interfrontal area very dark reddish brown, narrowing dorsally but width at minimum about twice as great as a parafrontal;

one pair of strong proclinate orbital setae. Vertex 0.16 of head width. Antennae more reddish than in ♂ (in the specimen seen). Body length 15.7 mm, wing length 13.4 mm [one specimen only seen].

#### MATERIAL EXAMINED

Holotype ♂, SOLOMON ISLANDS: Guadalcanal, Tapenanje, 10-30 [printed as 10-32].ix.1953 (*J. D. Bradley*). In British Museum (Natural History), London.

Paratypes. SOLOMON ISLANDS: 2 ♂, Guadalcanal, Gold Ridge, 1-2000 ft, 21.ix.1958 (*P. G. Fenemore*); 1 ♂, Guadalcanal, Honiara District, 500 ft, 2.i.1955 (*E. S. Brown*); 1 ♀, Guadalcanal, Honiara District, Mt Austen, 13.vi.1954 (*E. S. Brown*). All paratypes in British Museum (Natural History).

DISTRIBUTION. Known only from the island of Guadalcanal in the southern Solomon Islands.

AFFINITIES. A rather isolated and distinctive species (here placed in the separate species-group defined above) identifiable at a glance by the uniformly dark green body and infusate wings. The frons and vertex in the female are unusually narrow for the genus. No particular affinity with any other species is evident.

#### THE *MIRABILIS*-GROUP

DIAGNOSIS. Facial carina broad, in facial view conspicuously wider than an antenna. Head partly metallic, at least on postorbits and genal dilations, often also on parafrontals and upper parts of parafacials. Thorax and abdomen not unicolorous, abdomen with conspicuous pattern or if not then thorax or scutellum not concolorous with abdomen. Abdominal T<sub>5</sub> without strong setae behind the transverse row of setae. Surstylus of ♂ genitalia of varied form (Text-figs 41-44) but not sharply pointed at apex.

#### INCLUDED SPECIES

*Formosia (Formosia) blattina* (Enderlein) **comb. n.** CELEBES. [Holotype examined].

*F. (F.) bracteata* (Enderlein) **comb. n.** NEW IRELAND. [Holotype examined].

*F. (F.) callipygos* Gerstaecker. NEW GUINEA. [Holotype examined].

*F. (F.) eos* (Enderlein) **comb. n.** CELEBES. [Lectotype examined].

*F. (F.) fervens* (Walker). MOLUCCAS. [Holotype examined].

*F. (F.) flavipennis* (Macquart). JAVA, MALAYA. [Holotype examined].

*F. (F.) gemmata* (Enderlein) **comb. n.** NEW BRITAIN. [Lectotype examined].  
*viridescens* (Enderlein). [Lectotype examined].

*F. (F.) glorificans* (Walker) **comb. n.** NEW GUINEA. [Holotype examined].

*pectoralis* (Walker) **syn. n.** [Holotype examined].

*fulvipes* (Enderlein). [Holotype examined].

*F. (F.) heinrichiana* (Enderlein) **comb. n.** CELEBES. [Holotype examined].

*F. (F.) heinrothi* (Enderlein) **comb. n.** NEW BRITAIN. [Holotype examined].

*F. (F.) mirabilis* (Guérin-Ménéville). NEW GUINEA. [Holotype examined].

*plumicornis* (Macquart).

*F. (F.) solomonicola* Baranov **stat. n.** SOLOMON ISLANDS. [Lectotype examined].

KEY TO SPECIES OF THE SUBGENUS *FORMOSIA* S. STR.

[Note: *F. (F.) viridiventris* is omitted as it is easily recognized from the separate species-group characteristics and description already given. Specific limits are very uncertain at present for the other species, i.e. those of the *mirabilis*-group, and it is not yet clear to what extent the small differences in male genitalia provide dependable specific criteria. The following key is therefore very tentative and is merely a preliminary one which runs out the supposed species on the external characteristics shown by the types. Specimens exist in museum collections of undetermined species, possibly new, which will not necessarily run out in the key.]

- 1 Legs predominantly reddish yellow (at most only the tarsi blackish and some reddish darkening apically on the femora). Pleural regions of thorax with mainly pale yellow to golden orange hair. Epistome reddish yellow to pale tawny reddish. Third antennal segment orange (sometimes suffused with light brownish apically) . . . . . 2
- Legs black-brown to black (at most only apices of femora pale and tibiae sometimes a little reddish). Pleural regions of thorax with black or yellow hair. Epistome blackish brown to black. Third antennal segment dark reddish brown to black . . . . . 4
- 2 Eyes of ♂ very strongly approximated, interfrontal area obliterated on the upper frons, frons at narrowest point not more than 0.04 of head-width; upper eye facets conspicuously enlarged. Hair of tibiae all black. Upper parts of parafacials conspicuously metallic in almost any light . . . . . 3
- Eyes of ♂ not very strongly approximated (separated by distance about three times as great as diameter of anterior ocellus), interfrontal area reaching to ocellar triangle, frons at narrowest point 0.08–0.10 of head-width. Hair of tibiae partly or largely golden red. Upper parts of parafacials rather thickly pollinose, hardly appearing metallic from any viewpoint. [Java] . . . . . *F. flavipennis*
- 3 Hair of fore coxae mainly golden orange (only the strongest vestiture black). Extreme costal base with golden red hairing ventrally. Tarsi reddish yellow to dark red, almost concolorous with remainder of legs. Crinkled hair of mesopleural hind margin almost all golden orange. Frons of ♂ at narrowest point subequal in width to anterior ocellus, about 0.04 of head-width. [Celebes] . . . . . *F. eos*
- Hair of fore coxae mainly black (some golden hair at base). Hairing of costal base all black. Tarsi blackish, conspicuously darker than remainder of legs. Crinkled hair of mesopleural hind margin almost all black. Frons of ♂ extremely narrow, eyes nearly meeting, frons at narrowest point not as wide as anterior ocellus, only about 0.02 of head-width. [New Guinea] . . . . . *F. glorificans*
- 4 Hair of pleural regions of thorax all black . . . . . 5
- Hair of pleural regions of thorax largely pale yellow or golden . . . . . 11
- 5 Forms from Celebes . . . . . 6
- Forms from Moluccas, New Guinea or Bismarck Archipelago . . . . . 7
- 6 Calyptrae smoky brown with brown fringes. Postbuccal and genal hair black. Abdomen mainly a beautiful, brilliant, metallic blue; blue colour occupying most of each side of tergites 3–5 but divided medially by a broad bold black median vitta; hind margins of T3–T5 only narrowly black. Wings rather uniformly greyish brown infusate. ♂ eyes separated by a distance only about equal to twice width of anterior ocellus, but interfrontal area not obliterated and reaching to anterior ocellus (interfrontal area conspicuous therefore even at narrowest point of frons and slightly wider at this level than a parafrontal) . . . . . *F. heinrichiana*
- [This species is known only from the ♂ holotype]
- Calyptrae pale orange-yellow with yellow fringes. Postbuccal and genal hair pale yellow. Abdomen without such blue-and-black pattern, tergites 3–5 each with a purplish red transverse band that is not, or only very faintly, interrupted

- medially; the purplish red colour not strongly contrasting with the broad black tergite hind margins. [ $\sigma$  unknown] . . . . . ***F. blattina***  
 [This species is known only from the  $\varnothing$  holotype]
- 7 Abdominal pattern consisting of golden green, coppery green or reddish copper metallic bands on T<sub>3</sub>-T<sub>5</sub> which strongly contrast with a black centre line and black tergite hind margins; the metallic bands on each side usually distinctly arcuate, especially on T<sub>3</sub> and T<sub>4</sub>. [Moluccas and New Guinea] . . . . . 8
- Abdomen rather uniformly dark, the inconspicuous pattern consisting of a very dark blackish green or slaty bluish band across each tergite from T<sub>3</sub>-T<sub>5</sub> which is not medially interrupted and only very feebly contrasts with the black hind margin of the tergite; bands not at all arcuate. [Bismarck Archipelago] . . . . . 10
- 8 Calyptrae pale yellowish brown with pale yellow fringes; long fringe hair of outer side of upper calypter conspicuously yellow. Wing bases yellow-brown to naked eye. [Moluccas] . . . . . ***F. fervens***
- Calyptrae brown or dark brown with pale brown to dark brown fringes; long outer fringe hair of upper calypter quite distinctly brown. Wing bases dark brownish to naked eye. [New Guinea] . . . . . 9
- 9 Metallic fascia on each side of T<sub>5</sub> with its hind margin excavate and therefore narrower on the centre part than at the inner end (the metallic band only reaching back to the level of the transverse row of setae at the inner end) . . . . . ***F. mirabilis***
- Metallic fascia on each side of T<sub>5</sub> not noticeably excavate on the hind margin, extending back as far as, or almost as far as, the transverse row of setae (metallic band not wider at its inner end than elsewhere) . . . . . ***F. callipygos***
- 10 Mesonotum and scutellum golden green to blue-green. Basicosta yellowish on posterior part and only infuscate anteriorly. [New Britain] . . . . . ***F. gemmata***
- Mesonotum and scutellum mainly metallic coppery red or coppery purple, some coppery green colour on edges of prescutum and scutum. Basicosta uniformly black. [New Ireland] . . . . . ***F. bracteata***
- 11 Abdomen uniformly purplish black (at most with paler reddish purple tinge on T<sub>3</sub>). Eyes of  $\sigma$  very nearly meeting, frons at narrowest subequal in width to anterior ocellus and 0.03 of head-width. [Solomon Islands, ? also New Britain] . . . . . ***F. solomonicola***
- Abdomen black with brilliant metallic transverse bands on T<sub>3</sub>-T<sub>5</sub> ranging from golden green to greenish copper to silvery blue-green. Eyes of  $\sigma$  slightly more separated, frons at narrowest about one and a half times as wide as anterior ocellus and 0.05 of head-width. [New Britain] . . . . . ***F. heinrothi***

Subgenus ***PSEUDOFORMOSIA*** Brauer & Bergenstamm

*Pseudoformosia* Brauer & Bergenstamm, 1889 : 126 (58). Type-species: *Formosia moneta* Gerstaecker, 1860, by monotypy.

*Laccura* Enderlein, 1936 : 431. Type-species: *Rutilia saturatissima* Walker, 1861, by original designation. **Syn. n.**

DIAGNOSIS. Head partly metallic, at least on upper occiput and genal dilations. Head of  $\sigma$  almost fully holoptic, upper interfrontal area eliminated by meeting of parafrontals, frons at narrowest hardly wider than anterior ocellus. Eyes of  $\sigma$  sometimes with upper facets enlarged. Arista short plumose, hairs much longer than basal thickness of arista. Mentum of proboscis rather slender, tapering distally. No posthumeral setae (trace of such setae present in occasional specimen). Usually one pair of small presutural dorsocentral setae present (occasionally undeveloped, especially in  $\sigma$  of *moneta*). One *post ia* seta (occasional specimens aberrant and without such seta or with trace of very small second *post ia* in addition). Two sternopleural setae (1 + 1), rarely with a supernumerary third seta in addition. Postalar callus with 4-6 setae, rather variable in degree of development. Scutum without supernumerary

setae in prescutellar region between the hindmost *post acr* and *post dc*. Scutellum not at all or only very slightly flattened on disc. Fore coxa bare on inner half of anterior surface, except near apex. Transverse row of erect median marginal setae of T<sub>3</sub> present in both sexes. T<sub>5</sub> with or without strong erect setae behind the transverse row.

**DISTRIBUTION.** Molucca Islands (including Halmahera, Ternate, Batjan, Morotai, Obi) and New Guinea. Absent from Australia and unknown (probably absent) from the Philippines.

**DISCUSSION.** This subgenus is very closely similar to *Formosia* s.str. but is easily and constantly distinguishable and I consider it best to treat it as a valid subgenus. It differs from *Formosia* s.str. by having two sternopleural setae and in having the inner anterior half of the fore coxa bare (as in *Euamphibolia*) and by some other more minor and less constant differences such as the presence in most specimens of a small but distinct presutural dorsocentral seta (though this seta is most often absent in the males of *F. (P.) moneta*). *Pseudoformosia*, like *Formosia* s.str., is confined to tropical areas but has a much more restricted distribution than *Formosia*, as it is apparently unrepresented anywhere west of the Moluccas (i.e. in the Oriental Region) or in the Bismarck Archipelago or the Solomon Islands.

As known at present the subgenus is small and contains only four species; it is not considered necessary therefore to recognize any species-groups at the present time. However, it may be noted that the type-species, *F. (P.) moneta*, differs from the other included species by having the parafrontals and epistome shining metallic green or blue, in lacking strong setae on T<sub>5</sub> behind the main transverse row, and in having the upper eye facets of the male conspicuously enlarged; the other three species (listed below) have the parafrontals and epistome non-metallic, possess some strong setae laterally on T<sub>5</sub> behind the transverse row, and have the male eye facets normal. One species (*pauper* de Meijere) has the entire body very dark brownish black with dark brown wings, but the other species more closely resemble typical species of *Formosia* s.str. in having beautiful brilliant coppery green or bluish green metallic patterns on the abdomen and green to violet colouring on the thorax.

Engel (1925 : 357) synonymized *Pseudoformosia* with *Formosia* and this generic synonymy was presumably accepted by Malloch (1929 : 309), as he placed *moneta*—the type-species of *Pseudoformosia*—in the genus *Formosia*. In a slightly later paper Malloch (1930 : 104) wrote that 'The two new species [i.e. *quadripunctata* and *cingulata*] belong to the subgenus *Pseudoformosia*', though he did not say how this subgenus differed from typical *Formosia*; however, Malloch's use of *Pseudoformosia* in subgeneric status means that no new status is involved in the present work. Enderlein (1936 : 427) treated *Pseudoformosia* as a synonym of *Formosia*, but used the latter genus in a very narrow sense (including in it only three species, most of the species here included in *Formosia* s.str. being placed in *Pancala* Enderlein by Enderlein).

#### INCLUDED SPECIES

***Formosia (Pseudoformosia) excelsa*** (Walker) **comb. n.** MOLUCCAS. [Holotype examined].

***F. (P.) moneta*** Gerstaecker. NEW GUINEA. [Holotype examined].

*lucigena* (Walker) **syn. n.** [Lectotype examined].

*obscuripennis* Brauer & Bergenstamm (unavailable name).

*F. (P.) pauper* (de Meijere) **comb. n.** MOLUCCAS. [Lectotype examined].

*F. (P.) saturatissima* (Walker). MOLUCCAS, ? NEW GUINEA. [Lectotype examined].

# KEY TO SPECIES OF THE SUBGENUS *PSEUDOFORMOSIA*

- 1 Thorax and abdomen unicolorous dark brownish black (sometimes slightly purplish black) . . . . . ***F. pauper***  
[♂ genitalia not distinguishable from *saturatissima* (Text-fig. 50)]
- Thorax mainly metallic green to violet-blue, abdomen with a pattern of metallic green or cupreous spots and bands against a black background . . . . . 2
- 2 Parafrontals metallic blue or green. Epistome metallic, distinctly shining blue or green with violet tinges. Metallic pattern of abdominal T<sub>4</sub> consisting of a pair of large spots on the mid dorsum and a pair of slightly crescentic marks on the venter against the fore margin of the tergite; T<sub>5</sub> similarly with two metallic areas on each side, one laterodorsal and the other ventral . . . . . ***F. moneta***
- Parafrontals thickly whitish or pale brownish pollinose, non-metallic. Epistome not metallic, dark brown. Metallic pattern of T<sub>4</sub> consisting of a single continuous band around each side from near the mid dorsum to the mid venter; T<sub>5</sub> with a single large metallic area on each side . . . . . 3
- 3 Abdominal T<sub>3</sub> with a single broad metallic band around each side which is continuous from near the mid dorsum to the mid venter. Wings clear hyaline or almost so. Surstyli of ♂ genitalia rather narrow and pointed (Text-fig. 51) . . . . . ***F. excelsa***  
[This nominal species is known only from the teneral ♂ holotype in rather poor condition but appears to be distinct from *saturatissima*]
- Abdominal T<sub>3</sub> with a pair of small submedian metallic spots on the dorsum and with a narrow lateroventral metallic band on each side (some specimens may show traces of metallic colour slightly interconnecting the spots and bands). Wings brown with the infuscation most intense along the veins. Surstyli of ♂ genitalia wider and less sharply pointed (Text-fig. 50) . . . . . ***F. saturatissima***

# Subgenus *EUAMPHIBOLIA* Townsend **stat. n.**

*Euamphibolia* Townsend, 1916 : 618. Type-species: *Rutilia fulvipes* Guérin-Méneville, 1843 [= *Rutilia speciosa* Erichson, 1842], by original designation.

*Hega* Enderlein, 1936 : 419, 421. Type-species: *Hega viridicinctus* Enderlein, 1936 [= *Rutilia complicata* Walker, 1861], by original designation. **Syn. n.**

*Chromocharis* Enderlein, 1936 : 420, 432. Type-species: *Rutilia atribasis* Walker, 1861, by original designation. **Syn. n.**

**DIAGNOSIS.** Head thickly pollinose, nowhere metallic, at most only slightly shining in some lights on upper occiput. Eyes of ♂ not very strongly approximated, interfrontal area always distinguishable on upper part and at least as wide as parafrontal, frons at narrowest subequal in width to or much wider than facial carina. Upper facets of ♂ eyes not or only slightly enlarged. Arista micropubescent, pubescence at most only as long as basal diameter of arista. Proboscis in profile not noticeably tapering towards the apex, upper and lower edges subparallel. Posthumeral setae present, at least one each side and often more. 2–5 presutural dorsocentral setae (sometimes weak and scarcely differentiated from the hair in ♂). 2–3 *post ia* setae (sometimes small fourth seta and ♂ sometimes with only one main *post ia* seta preceded by a very small fine inconspicuous setula weakly differentiated). Two sternopleural setae (1 + 1),

anterior *stpl* sometimes very weak and hair-like in ♂. Postalar callus with three setae. Scutum without supernumerary prescutellar setae between the hindmost *acr* and *dc* setae. Disc of scutellum not conspicuously flattened. Fore coxa bare on inner half of anterior surface (except near apex). T<sub>3</sub> with a transverse row of median marginal setae either in both sexes or in ♀ only. T<sub>5</sub> with long dense hair behind the transverse row of setae in which some long strong setae developed.

**DISTRIBUTION.** From the Molucca Islands (including Halmahera, Ternate, Batjan, Seram, Buru, Run Island) through New Guinea to the Solomons, and in Australia from Queensland to Tasmania, also Western Australia. [No specimens have been seen from Bismarck Archipelago or Aru Islands but these areas are almost certainly within the subgeneric range: Osten Sacken (1881) recorded a specimen of *pretiosa* Snellen van Vollenhoven from Wokan in the Aru Islands.]

**DISCUSSION.** Townsend (1916) proposed the genus *Euamphibolia* for *Rutilia fulvipes* Guérin-Méneville, a large and attractive Rutiline with a black-and-white body pattern superficially similar to that of some *Amphibolia* species (Brauer & Bergenstamm, 1889 : 418, had in fact placed *fulvipes*, though attributing the species to Macquart, in the genus *Amphibolia*). This distinctive species was described by Erichson (1842) with the name *Rutilia speciosa* in the year before Guérin-Méneville's (1843) description of *fulvipes* was published; nevertheless it is clear from Guérin-Méneville's account that he knew of Erichson's name, for he expressed some doubt as to whether his *fulvipes* was really distinct from Erichson's *speciosa*. Later authors have had no doubts that the names are synonyms: the synonymy of *fulvipes* with *speciosa* was implied by Malloch (1927 : 351) when he cited *speciosa* as the genotype of *Euamphibolia*, was formally established by Townsend (1932 : 38), and was cited by Enderlein (1936 : 430) and Townsend (1938 : 414). Direct comparison of original types is not possible, for although Erichson's types still exist (and have been examined) that of Guérin-Méneville is lost: but Guérin-Méneville's detailed description of *fulvipes* applies so perfectly to Erichson's types of *speciosa* that I here accept the synonymy as certainly correct (as this is in accord with previous practice there is no need of neotype designation for *fulvipes*). (It should be noted that Townsend, 1932, 1938, was in error to state that a holotype—sex unspecified by Townsend—of *fulvipes* from New South Wales is in Paris Museum: there is no such specimen in Paris, although Macquart's collection contains material determined as *fulvipes* by Macquart.)

Malloch (1927 : 351) wrote of *speciosa* as follows: 'This is the genotype of *Euamphibolia* Townsend, but I do not consider it entitled to generic separation from *Formosia*, the only character distinguishing it being the pubescent arista. It may ultimately be accorded subgeneric rank with *atribasis*.' I completely agree with Malloch's views (although there are certainly more characters than the pubescent arista which distinguish *Euamphibolia* from *Formosia* s.str.) and here accord to *Euamphibolia* the status of a subgenus within *Formosia* s.l. In agreement also with Malloch, I consider Walker's *atribasis* to be consubgeneric with *speciosa*, and the generic name *Chromocharis* Enderlein (of which *atribasis* is type-species) therefore enters into new synonymy with *Euamphibolia*.

The generic name *Hega* Enderlein is also a new synonym of *Euamphibolia*.

Enderlein characterized *Hega*, and differentiated it from related genera, by the lack of median marginal setae on abdominal T<sub>3</sub>, without realizing that in the group of species to which the type-species (*viridicingens*) belongs the lack of median marginals on T<sub>3</sub> is only a sexual character. The males lack such setae and the females possess them. The genitalia of the males, with the very heavy subquadrate surstyli, are of an identical kind with the male genitalia of *speciosa*, and confirm beyond any doubt that *Hega* is a synonym of *Euamphibolia*.

The subgenus *Euamphibolia* as here re-defined is easily distinguished from the other subgenera of *Formosia* by the characters given in the accompanying subgeneric key. Apart from the characteristic shape of the ♂ surstyli (see Text-figs 40, 52, 53), *Euamphibolia* is immediately and most easily distinguished from *Pseudoformosia* and *Formosia* s.str. by the presence of only three setae on the postalar callus and by the rather broad non-tapering shape of the mentum when seen in profile (Text-fig. 12).

At present *Euamphibolia* contains only a small number of species. Two of these, *speciosa* and *fusca* sp. n., are very distinct from the others because of their coloration, but as there are so few species and no really tangible structural characters on which they can be grouped it has not been thought useful to recognize any species-groups as formally defined entities.

Very little is known of the early stages and host relations. Townsend (1936 : 152) has briefly described the first stage larva, and has also figured the egg and first stage larva under the name *E. fulvipes* (Townsend, 1942, plate 21, fig. 147; plate 30, fig. 249; and plate 43, fig. 250). Two specimens have been seen of an undetermined species of the subgenus from Lae, in New Guinea, which have associated puparia and data showing that the larvae were found in a sago-palm trunk parasitizing the larvae of a Cetoniid beetle. Otherwise nothing is yet known.

#### INCLUDED SPECIES

***Formosia (Euamphibolia) atribasis*** (Walker). MOLUCCAS. [Lectotype examined].

***F. (E.) complicata*** (Walker) **comb. n.** MOLUCCAS; WEST IRIAN. [Holotype examined].

*pretiosa* (Snellen van Vollenhoven) **syn. n.** [Lectotype examined].

*sapphirina* (Walker) **syn. n.** [Holotype examined].

*smaragdifera* Bigot **syn. n.** [Lectotype examined].

*viridicingens* (Enderlein) **syn. n.** [Holotype examined].

***F. (E.) engeli*** (Enderlein) **comb. n.** RUN ISLAND, BURU. [Lectotype examined].

***F. (E.) faceta*** (Enderlein) **comb. n.** AUSTRALIA (Queensland); NEW GUINEA. [Holotype examined].

***F. (E.) fusca*** Crosskey **sp. n.** SERAM. [Holotype examined].

***F. (E.) smaragdina*** Malloch. AUSTRALIA (Queensland). [Holotype examined].

***F. (E.) speciosa*** (Erichson). AUSTRALIA (Australian Capital Territory, New South Wales, Queensland, Tasmania, Victoria, Western Australia). [Lectotype examined].

*fulvipes* (Guérin-Méneville) [Holotype lost].

KEY TO SPECIES OF THE SUBGENUS *EUAMPHIBOLIA*

- 1 Legs entirely reddish yellow. Dorsum of thorax black with bold white spots and vittae. Abdomen with black-and-white pattern. Palpi yellow. Pleural regions of thorax with yellow to golden orange hair. Hair of coxae and femora largely golden orange. [Australia and Tasmania] . . . . . ***F. speciosa***
- Legs entirely black or brownish black. Dorsum of thorax not so, greenish to blue-violet or if blackish (*fusca*) then without white spots. Abdomen not black-and-white. Palpi dark brown or blackish. All thoracic hair black. Hair of coxae and femora all black . . . . . 2
- 2 Thorax and abdomen unicolorous dark black-brown. [Seram] ***F. fusca*** sp. n. (p. 37)
- Not unicolorous dark species, dorsum of thorax and usually also much of the abdomen metallic greenish, cupreous, blue or violaceous, the abdomen always noticeably banded or patterned . . . . . 3
- 3 Hair of occiput and postbuccae all black. Head pollinosity distinctly bicolorous, white on lower parts of parafrontals and on parafacials, postorbits, and most of genae, and pale golden brown on upper parts of parafrontals and on occiput, facial carina, antennal foveae and epistome (golden brown colour of parafrontals best seen from above). Thorax without white pollinosity, with only merest trace of yellowish brown pollinosity thinly over humeral calli and fore margin of prescutum. Dorsum of T<sub>5</sub> with a pair of widely separated golden green subtriangular metallic areas which extend back only about as far as the main transverse row of setae. [Batjan] . . . . . ***F. atribasis***
- Hair of occiput white or yellow, hair of postbuccae usually also pale but occasionally brownish. Head pollinosity unicolorous white, greyish white or yellowish white. Thorax usually with some white pollinosity on prescutum and humeral calli, often also on mesopleuron and sternopleuron. Dorsum of T<sub>5</sub> with metallic areas not of this form . . . . . 4
- 4 Dorsum of abdomen with broad dark coppery red or purplish bands on each side of T<sub>3</sub>-T<sub>5</sub> which are clearly separated medially on all tergites (T<sub>3</sub>, therefore, as well as other tergites with distinct black median vitta); the dark colour of the metallic bands not strongly contrasting with black areas of tergites and abdomen appearing generally dark. Wings very conspicuously brown. [Run Island and Buru]
- F. engeli***
- Dorsum of abdomen with a bold pattern of golden green, reddish green, emerald or blue metallic areas on a black background, the abdomen not appearing rather uniformly dark. Wings mainly clear hyaline or nearly so (except for usual black basal area), only weakly suffused with yellowish brown along the veins . . . . . 5
- 5 Abdominal T<sub>5</sub> with the metallic areas covering most of the dorsum, at most only the posterolateral corners of the tergite and a very fine inconspicuous median line black. ♀ without definite sternopleural pollinose spot and with rather thin white pollinosity over mesopleuron which has a distinctly shifting appearance from different angles. Upper occiput metallic greenish adjacent to the postocular setulae. ♂ frons at narrowest 0.14-0.15 of head-width. [Moluccas and West Irian]
- F. complicata***
- Abdominal T<sub>5</sub> with metallic areas confined to middle part of tergite dorsum, sometimes evanescent so that T<sub>5</sub> is virtually all black in ♂, metallic areas of T<sub>5</sub> dorsum usually in form of two irregular elongate golden green areas which nearly meet posteriorly in the tergite depression and together are roughly V-shaped. ♀ with a small but definite pollinose spot on the upper sternopleuron and with a boldly marked white pollinose spot on mesopleuron which does not strongly shift with the light direction. Upper occiput either metallic or non-metallic adjacent to postocular setulae. ♂ frons at narrowest 0.12-0.13 of head-width . . . . . 6
- 6 Upper occiput evenly white pollinose and showing little or no trace of metallic colour

near the postocular setulae. White pollinosity of humeral calli and prescutum of ♀ thick and very conspicuous to naked eye, making anterior half of thoracic dorsum appear rather greyish (except for the black vittae). Pollinose spot of sternopleuron weakly marked and partly brownish. Submedian pair of black marks on the anterior edge of scutum (i.e. the ends of the inner pair of black mesonotal vittae) more or less connected by dark brown coloured area medially. Small species, length 12.5.16 mm. [Queensland and New Guinea] . . . . . ***F. faceta***

- Upper occiput distinctly metallic green in the area of the postocular setulae. White pollinosity of humeral calli and prescutum of ♀ inconspicuous to naked eye, not distinctly reaching to transverse suture, whole mesonotum appearing bright metallic green or blue-green. Pollinose spot of sternopleuron very distinct, almost entirely white like the mesopleural spot. Submedian pair of black marks on anterior edge of scutum (ends of the inner pair of black mesonotal vittae) small and square and widely separated by the metallic green colour, which reaches medially to the front edge of the scutum (transverse suture). Large species, length 17.5-20 mm. [Queensland] . . . . . ***F. smaragdina***

### ***Formosia (Euamphibolia) fusca* sp. n.**

(Text-fig. 40)

♂. *Head*. Ground colour blackish brown, slightly more reddish brown on facial carina, antennal foveae and upper genae; lunula shining yellowish brown, interfrontal area velvety brownish black; head rather thickly yellowish white pollinose on anterior parts, more thinly greyish white pollinose on occipital regions. Parafrontal and genal hair black, occipital hair reddish brown. Eyes not very strongly approximated and upper facets not enlarged; upper interfrontal area distinct and nearly twice as wide as parafrontal, frons at narrowest about 0.14 of head width and wider than facial carina. Ocelli slightly raised, ocellar setae undeveloped. Facial carina nearly twice as long as epistome, subparallel-sided. Gena one-third (0.33) of eye height. Parafrontal about 3.5 times as wide as width of third antennal segment and much wider than length of this segment. Antennae dark reddish-brown, very small and falling short of mouth-margin by very much more than their own length; third segment about 2.1 times as long as second segment; arista micropubescent. Palpi brown with paler tips. *Thorax*. Blackish brown with very thin brownish pollinosity, non-metallic; scutellum slightly more reddish brown than scutum. Thoracic hair entirely black. Chaetotaxy normal for subgenus but setae rather small [*post ia* setae and postalar setae of left side and some marginal scutellar setae missing from holotype, but pores distinct]. Anterior sternopleural seta minute, almost hair-like. Scutellum with five pairs of marginal setae, and one or two smaller irregular submarginals. *Wings*. Basicostae and basal spots extremely dark, almost black; membrane mainly hyaline except for narrow traces of yellowish brown colour immediately adjacent to veins. Calyptrae dark brown with brown marginal hair. *Legs*. Black with entirely black hair; femora not conspicuously attenuate. Mid tibia without *ad* setae and without definite *p* setae; hind tibia with extremely well developed long close-set *ad* fringe, without *ad* seta among the fringe, and without *pd* setae. Claws very long. *Abdomen*. Entirely blackish brown with black hair, concolorous with thorax. Dorsal hair exceedingly fine and abundant, recumbent on T<sub>3</sub> and very dense medially, semi-erect on T<sub>4</sub> and erect on T<sub>5</sub>. T<sub>3</sub> without median marginal setae; T<sub>5</sub> with some long setae developed among the long fine hair posteriorly to the transverse row of setae. Depression of T<sub>5</sub> well formed and conspicuous. Genitalia as in Text-fig. 40. *Measurements*. Body length 18.2 mm, wing length 18.5 mm [one specimen, holotype].

♀. Extremely similar to ♂ except for usual sexual differences. Interfrontal area only slightly narrowing dorsally; proclinate orbital setae absent. Vertex 0.25 of head width. Facial carina more pinched in at lower end than in ♂. Body length 20.0 mm, wing length 18.8 mm [one specimen].

## MATERIAL EXAMINED

Holotype ♂, INDONESIA: Moluccas, Seram (=Ceram), Mansela, 2500 ft, 1919 (Pratt). In British Museum (Natural History), London. [Genitalia on slide.]

Paratype. 1 ♀, INDONESIA: Moluccas, Seram (A. R. Wallace) (BMNH, London).

DISTRIBUTION. Known only from the island of Seram (=Ceram) in the Moluccas.

AFFINITIES. A very distinctive species readily identified at a glance by the unicolorous blackish brown colour and large size; no particular affinity with another species is evident at present. Although only one male and one female are available so far, I have no hesitation in describing the new species because it is so clearly distinct from all other known species of the subgenus *Euamphibolia*, to which *fusca* sp. n. is certainly assignable.

Genus **FORMODEXIA** gen. n.

Type-species: *Rutulia volucelloides* Walker, 1861.

DIAGNOSIS. Facial carina large, with subparallel sides and at most only slightly bulbous medially, convex on outer surface. Epistome not very strongly prominent, weakly set off from carina by shallow depression. Eyes of ♂ very strongly approximated so that upper frons slightly narrower than facial carina, the upper facets not noticeably enlarged. Parafacials bare. Buccal opening very narrow, in ♂ hardly wider than facial carina. Genal dilation moderately developed, not reaching forward as far as front level of eye. Head nowhere metallic. Arista pubescent. Palpi of both sexes exceptionally long and slender. Proboscis rather long and slender and slightly tapering before the labellae. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted at lower level than other marginal setae; total of six or seven pairs of marginals; disc of scutellum not flattened. Postalar callus with 5 setae. Postalar wall with dense hair tuft. Suprasquamal ridge bare. Upper calypter normal. Tegula without the usual long wiry posterior setulae. Costal base explanate and with well formed close-set curved marginal fringe, wings appearing to have basal 'shoulder' to naked eye. Abdomen without downwardly-directed spiniform setae on ventral margins of tergites; T<sub>3</sub> without either median or lateral marginal setae; intermediate tergites without discal setae. T<sub>5</sub> convex, without median depression or prominent posterolateral corners, apical part (behind the single transverse setal row) sharply bent downwards in ♂.

DISTRIBUTION. Only known from the Moluccas, including the islands of Halma-hera and Batjan; probably occurring also in other islands of the Moluccas group.

DISCUSSION. The curious Rutiliine species described by Walker as *Rutulia volucelloides* (of which two other Walker names are synonyms, as indicated later) from the Molucca islands has a suite of characters which preclude it from being placed satisfactorily in any of the genus-group segregates of Rutiliini already described, and in order to present a balanced classification of this tribe it is necessary to assign *volucelloides* to a new genus, for which the name *Formodexia* gen. n. is proposed.

*Formodexia* gen. n. agrees with *Formosia*, and differs from all other Rutiliine genera, by having the postalar wall haired, but it differs from *Formosia* in having the apical scutellar setae set lower than the others, in the explanate costal base and lack of wiry posterior hairs on the tegula, and in lacking the strong downward-pointing spinous setae on the abdominal venter which are characteristic of *Formosia*;

the same differences also distinguish *Formodexia* from *Rutilodexia*. *Formodexia* resembles *Rutilia* in having the apical scutellar setae at a lower level than the other marginal setae, but is easily separated from all *Rutilia* species by the hairy postalar wall and from almost all *Rutilia* by having the suprasquamal ridge bare.

There is a strong superficial resemblance between *Formodexia* and *Prodiaphania*, especially because of the explanate costal bases of both sexes in both genera and because of the strongly narrowed buccal opening, but *Formodexia* is very easily distinguished from *Prodiaphania* by the exceedingly long slender palpi (palpi extremely reduced in *Prodiaphania*), by the haired postalar wall (postalar wall bare in *Prodiaphania*), by the pubescent arista (arista plumose in *Prodiaphania*) and by the normal small upper calypter (upper calypter much enlarged in *Prodiaphania*).

Although *Formodexia* is unlikely to be confused with the remaining Rutiline genera it may be useful to note the following distinctions: the new genus differs from *Chrysopasta* by having the postalar wall haired and the suprasquamal ridge bare and in the bare parafacials, and the same features of the postalar wall and the suprasquamal ridge distinguish it also from *Amphibolia* (but some species of the latter agree with *Formodexia* in having bare parafacials). From *Chetogaster*, which only doubtfully belongs to the Rutiliini, it may be separated at once by the five setae on the postalar callus (only two such setae in *Chetogaster*).

Additional features of *Formodexia* to those cited in the diagnosis, given to facilitate comparison with various subgenera of *Rutilia* and *Formosia*, are as follows: no development of strong spiniform setae on either thorax or abdomen; setae of pre-scutum and scutum reduced, *post ia* setae absent; two sternopleural setae (1 + 1); claws of ♂ unusually small; ♀ without proclinate orbital setae; hind tibia with short well developed and close-set *ad* fringe; head of ♂ appearing unusually small in relation to body size; both sexes with a row of well developed setae along the basal half of the *a* surface of the mid femur.

A surprising aspect of *Formodexia* is the extreme paucity of material so far known of *volucelloides*, the only species: I know of only five specimens, all in the British Museum (Natural History), of which three are Walker's types of three synonymic names and the other two are old specimens from Batjan that formed part of Bigot's collection. Of the five specimens, only the primary type (lectotype herein designated) of *volucelloides* is a male, but the species is so distinctive that there is no doubt whatever that the four female specimens are conspecific with this male; as a consequence, Walker's names *trixoides* and *ignobilis* fall as new synonyms of *volucelloides*.

Enderlein (1936), without seeing Walker's types and therefore without any real idea of their characters, assigned *ignobilis* to *Chrysorutilia* Townsend and assigned *volucelloides* and *trixoides* to his genus *Donovanius*, thus in effect associating these names with *Rutilia* (for *Chrysorutilia* and *Donovanius* are, in the present treatment, regarded as not generically distinguishable from *Rutilia*). As already shown, all three specific names belong to one species which is not assignable to *Rutilia*.

Attention may usefully be drawn here to an error in Walker's citation of type-locality for *ignobilis*: this was originally recorded in error as Gorrite (in Brazil), but the correct type-locality (as indicated by a label on the specimen in Walker's writing) is southern Gilolo (=Halmahera) in the Molucca islands.

## INCLUDED SPECIES

*Formodexia volucelloides* (Walker) **comb. n.** **MOLUCCAS.** [Lectotype examined].

*trixoides* (Walker) **syn. n.** [Holotype examined].

*ignobilis* (Walker) **syn. n.** [Holotype examined].

Genus *RUTILODEXIA* Townsend

*Rutilodexia* Townsend, 1915 : 23. Type-species: *Rutilia angustipennis* Walker, 1859, by original designation.

*Bothrostira* Enderlein, 1936 : 413. Type-species: *Bothrostira prisca* Enderlein, 1936, by original designation. **Syn. n.**

*Rutilosia* Paramonov, 1968 : 355. [Name published in footnote to generic key: unavailable under Article 13 (b) of *International Code of Zoological Nomenclature*, no fixation of type-species.]

**DIAGNOSIS.** Facial carina large and subparallel-sided, at most slightly widened medially, often slightly sulcate. Epistome not strongly prominent, separated from facial carina by very shallow depression only. Eyes of ♂ not very strongly approximated, upper frons at least as wide as and usually a little wider than facial carina, upper facets not enlarged. Parafacials bare. Buccal opening wide, very much wider than facial carina in both sexes. Genal dilation weakly developed, anterior edge very remote from epistome. Head nowhere metallic. Arista pubescent. Palpi fully developed normal size. Proboscis short, rather slender and tapering before labellae. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted at lower level than other marginal setae (apicals sometimes hair-like); total of 7-11 pairs of marginals; disc of scutellum not noticeably flattened. Postalar callus with 4-6 setae. Postalar wall bare (at most a very few hairs adjacent to those on callus edge). Suprasquamal ridge bare. Upper calypter normal. Tegula with normal long wiry posterior setula. Costal base not explanate. Abdomen with slightly spiniform setae ventrally on tergite margins which are directed downwards and backwards; T<sub>3</sub> without median marginal setae in ♂, with single pair of such setae in ♀; intermediate tergites without discal setae. T<sub>5</sub> broad, without or with at most only slight median depression, posterior corners not prominent.

**DISTRIBUTION.** Aru Islands, New Guinea and New Britain.

**DISCUSSION.** It is considered best to recognize *Rutilodexia* Townsend as a valid genus for a small group of species found (so far) only in the Papuan subregion and differing on total suite of characters from the species placed in *Rutilia* s.l., though undoubtedly *Rutilodexia* is very closely allied to *Rutilia* and does not differ from it by very convincing characters. The general appearance of *Rutilodexia* species is very similar to some *Rutilia* (especially in the subgenus *Donovanius* Enderlein), and *Rutilodexia* has the bare postalar wall and low-set apical scutellar setae exactly as in *Rutilia*; furthermore, the facial carina is exactly of the *Rutilia* type. The supra-squamal ridge is, however, bare in *Rutilodexia* and this character provides a distinction from almost all of *Rutilia* species; in *Rutilia* the supra-squamal ridge is nearly always haired, but there are some species which (on overall balance of characters) must be placed in *Rutilia* even though the ridge is bare. The best feature for distinguishing all *Rutilodexia* from all *Rutilia* seems to lie in the genal dilation (Text-figs 4 & 5); in *Rutilodexia* this is unusually small and its anterior limit is formed by an oblique ridge extending downwards from behind the eye; in *Rutilia* the genal

dilation is more or much more extensive and rounded anteriorly. In *Rutilodexia* the anterior part of the genal dilation is very remote from the epistome and is not as far forward on the head as the level of the front of the eye; in *Rutilia* the anterior part of the dilation normally reaches forward to or beyond the level of the front of the eye and is thus less remote from the epistome.

The ♂ genitalia of *Rutilodexia* species have no special characteristics; the surstyli and cerci have a simple form (Text-fig. 90) generally resembling that found in a number of *Rutilia* s.l. species.

The form of the genal dilation and close resemblances in all other characters indicate without doubt that *Bothrostira prisca* Enderlein is congeneric with, though a separate species from, *Rutilodexia angustipennis* (Walker), and Enderlein's generic name *Bothrostira* therefore falls in new synonymy with *Rutilodexia*. It is certain also that Paramonov's (1968) posthumously published and unavailable name *Rutilosia* applies to the same concept (because the manuscript notes left at his death show that Paramonov included *angustipennis* Walker in *Rutilosia* without him appreciating that this nominal species was already type-species of *Rutilodexia*). Comparison of Enderlein's types of *B. prisca* (♂) and *Idania ralumensis* (♀), in conjunction with later collecting of both sexes, shows that both names apply to the same species; as *ralumensis* is certainly the female of *prisca* (though Enderlein (1936 : 409, 413) had the nominal species in separate genera) the names are here placed in new synonymy, with *prisca* treated as the valid name because based on a male type. *R. papua* (Bigot) is perhaps the same species as *R. angustipennis* (Walker) but there is not sufficient evidence at present to justify synonymy.

Nothing is known of the hosts of *Rutilodexia* species.

#### INCLUDED SPECIES

*Rutilodexia angustipennis* (Walker). ARU ISLANDS. [Holotype examined].

*R. papua* (Bigot) **comb. n.** NEW GUINEA. [Lectotype examined].

*R. prisca* (Enderlein) **comb. n.** NEW BRITAIN. [Holotype examined].

*ralumensis* (Enderlein) **syn. n.** [Lectotype examined].

#### KEY TO SPECIES OF THE GENUS *RUTILODEXIA*

[Note: The primary types of *angustipennis* and *papua* are male and female respectively, and the opposite sexes cannot yet be positively associated.]

- |   |  |                                     |
|---|--|-------------------------------------|
| 1 | Males . . . . .  | 2                                   |
| — | Females . . . . .  | 4                                   |
| 2 | Hind tibia with a strong submedian <i>ad</i> seta and a very weak inconspicuous <i>ad</i> fringe.<br>Hind femur with a row of strong <i>av</i> setae on the apical half. [Aru Islands & New Guinea]                      | <b><i>R. angustipennis</i></b>      |
| — | Hind tibia without a submedian <i>ad</i> seta and with a well developed regular close-set <i>ad</i> fringe. Hind femur without strong <i>av</i> setae on apical half, the vestiture hair-like (New Guinea & New Britain) | 3                                   |
| 3 | Dorsum of thorax and abdomen contrasting in colour, the mesonotum and scutellum metallic dark green or bluish green and the abdomen tawny yellowish with a conspicuous black median line. [New Britain]                  | <b><i>R. prisca</i></b>             |
| — | Dorsum of thorax and abdomen more or less concolorous, dark brownish or blackish brown with a purplish green or violaceous sheen and without a noticeable dark median line on the abdomen. [New Guinea]                  | Undetermined sp. (? <i>papua</i> ♂) |

- 4 Hair of the barette, posteroventral parts of the pteropleuron and outer edge of postalar callus golden yellow (in contrast with black hair on remainder of thorax). Prescutum with only indistinct traces of dark vittae. Head tawny or dark reddish with brassy yellow pollinosity. Wings rather conspicuously smoky on apical half and yellowish on basal half. [New Britain] . . . . . *R. prisca*
- Hair of barette and all hair of pteropleura and postalar calli black like the rest of the thoracic hair. Prescutum with four bold black-brown vittae. Head blackish brown with pale greyish yellow pollinosity. Wings not strikingly yellow and smoky brownish. [New Guinea] . . . . . *R. papua*

### Genus *RUTILIA* Robineau-Desvoidy

*Rutilia* Robineau-Desvoidy, 1830 : 319. Type-species: *Tachina vivipara* Fabricius, 1805, by subsequent designation of Crosskey (1967 : 26).

DIAGNOSIS. Facial carina large, often broad with subparallel sides, sometimes slightly knob-like or slightly evanescent ventrally. Epistome slightly to very strongly prominent. ♂ head never holoptic, upper frons at least as wide as facial carina, upper eye facets not enlarged. Parafacials bare or haired. Buccal opening normal, wider than facial carina in both sexes. Genal dilation well developed, usually rounded anteriorly and extending forwards nearly to level or beyond level of front of eye. Head normally mainly pollinose, partially metallic in some forms. Arista virtually bare to very short-plumose, usually pubescent. Palpi fully developed normal size (except reduced in *micropalpis*). Proboscis short with sides subparallel in profile or at most only a little tapering before labellae. Prosternum and prosternal membrane bare or haired. Scutellum with apical pair of setae inserted at lower level than other marginal setae (very rarely apicals absent); total of 3-10 pairs of marginals; disc of scutellum convex or flattened. Postalar callus with 3-5 (rarely 6) setae. Postalar wall bare (at most a very few hairs adjacent to those on callus edge). Suprasquamal ridge almost always haired, bare in a few species. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base sometimes distinctly explanate. Abdomen with marginal vestiture of tergite venters weak and semi-recumbent (directed backwards), if bristling slightly spiniform then not directed vertically downwards; T<sub>3</sub> with or without median marginal setae; intermediate tergites without discal setae. T<sub>5</sub> of varied form, convex truncate conical to broad and flattened with median depression.

DISTRIBUTION. Especially well represented and widespread in Australia, but occurring also in Oriental Region from India and Ceylon through Malaya to Philippines and Timor; poorly represented in New Guinea, occurring in Solomon Islands, New Hebrides, Fiji, Samoa and Lord Howe Island. Absent on present evidence from Moluccas and Bismarck islands.

DISCUSSION. The genus *Rutilia* in the wide sense here adopted (which corresponds in the main with the sense of the genus adopted by Malloch and Paramonov) is the largest genus of Rutiliini and contains nearly half the described species. It is the dominant element in the Rutiliine fauna of Australia, and contains most of the large metallic and boldly patterned species that are such a conspicuous element in the Australian dipterous fauna. The genus is not easy to define in a completely satisfactory way, and the diagnosis has perforce to take into account several species that differ from typical *Rutilia* in some conspicuous feature, even though on their totality of characters they must clearly be assigned to the genus: for example, some species have the suprasquamal ridge bare (e.g. *cingulata* Malloch and *confusa* Malloch, which were erroneously placed in *Formosia* by Malloch because of this), and

occasionally specimens occur which lack the apical setae of the scutellum. The differences between *Rutilia* and other Rutiline genera have been alluded to elsewhere under the different genera and need not be repeated here, but it might be useful to emphasize the chief differential characters which separate *Rutilia* and *Formosia*, for there has always been some difficulty in separating these genera satisfactorily since the time when Guérin-Ménéville (1843) first distinguished them. The table below indicates the main differences:

<i>Rutilia</i>	<i>Formosia</i>
Postalar wall bare (at most a very few hairs immediately below edge).	Postalar wall with dense hair tuft.
Suprasquamal ridge haired (bare in a few exceptions).	Suprasquamal ridge bare.
Apical scutellar setae inserted below level of other marginal setae (very rarely absent).	Apical scutellar setae inserted level with other marginal setae.
Marginal setae of abdominal tergite venters usually very weak, recumbent, at most only slightly spiniform and directed backwards as well as downwards.	Marginal setae of abdominal tergite venters very strong, spiniform, directed straight downwards.

Some supposed genera have been split off from *Rutilia* by various authors but not generally accepted as separate genera (e.g. *Microrutilia* Townsend, *Chrysorutilia* Townsend), and Enderlein (1936) fragmented *Rutilia* into eleven genera placed in two subtribes, using such features as the present or absence of median marginal setae on abdominal T<sub>3</sub> or the presence or absence of a median depression in the last abdominal tergite (T<sub>5</sub>) as generic characters. In the present work none of these genera has been considered valid as a taxon worthy of generic rank, but a few have been redefined in the light of the characters shown by the type-species and recognized as subgenera within *Rutilia*; in all, seven subgenera are here recognized and defined, for six of which there are pre-existing genus-group names available (these including *Rutilia* s.str.) and for one of which a new subgeneric name is proposed (there being no previously published name applying to the taxon concerned). The subgeneric name *Neorutilia* Malloch and the following sixteen generic names are synonyms of *Rutilia* s.l. (the correct synonymic distribution of these names according to the subgeneric classification here proposed is shown at the head of each subgenus): *Agalmia* Enderlein, *Chrysorutilia* Townsend, *Donovanius* Enderlein, *Eucompsa* Enderlein, *Grapholostylum* Macquart, *Habrota* Enderlein, *Idania* Enderlein, *Menevillea* Enderlein, *Microrutilia* Townsend, *Philippoformosia* Townsend, *Prosenostoma* Townsend, *Psaronia* Enderlein, *Psaroniella* Enderlein, *Pogonagalmia* Enderlein, *Stiraulax* Enderlein and *Zoramisceus* Enderlein.

Though the numerous species of *Rutilia* s.l. (some 60 species at present, but several undescribed species known) show great diversity in their general appearance—size, colouring, pollinose patterns—and though a few species are difficult to place satis-

factorily in any particular segregate, it is generally true that the great majority of species can be placed alongside obviously allied species where together they form natural subdivisions of the genus, each of which can be reasonably well characterized and differentiated from other such segregates. It is here considered best to treat these major groupings of the species as subgenera, a course which has not previously been adopted with *Rutilia* (except for Malloch's (1936) recognition of his new species *simplex* as representing a new subgenus, and his recognition of subgenus *Microrutilia* in the same paper). The seven subgenera recognized can be distinguished by the accompanying key and diagnoses, but it may be useful to draw attention here to some general conclusions to which I have come before formulating these subgenera.

It is certainly unwise in *Rutilia* (as indeed generally in the Tachinidae) to aggregate species into a defined taxon merely on the common possession of a single character, or to attach too great an importance to some single striking attribute that may well have, and usually almost certainly has, been evolved more than once within the whole complex of forms. This course forced Malloch to place species such as *confusa* Malloch and *cingulata* Malloch out of *Rutilia* and in *Formosia* instead, simply because on the single character of bare suprasquamal ridge they are atypical for *Rutilia*, though on their overall totality of characters these species clearly fit *Rutilia* and not *Formosia*. Yet within *Rutilia* the rest of the characters shown by *confusa* and *cingulata* leave little doubt that these two species are not closely allied, and an unnatural group would be formed by defining a taxon (subgenus or species-group) which brought these species together: it seems certain that bareness of the suprasquamal ridge has arisen more than once within *Rutilia*, so that while the character can be usefully used as one of the characters of an infrageneric taxon it cannot be used as an exclusive diagnostic feature. Similarly, the depression in the last visible abdominal tergite (T5), which is such a conspicuous feature of many *Rutilia* species and was used as a generic character by Enderlein, has undoubtedly in my view arisen at least twice in separate lines of evolutionary development in the genus: it occurs principally in the subgenus *Donovanius* but is also found in *Rutilia* s.str., groups which seem to resemble each other convergently but differ much when all their characters are taken into account.

In *Rutilia* the chaetotaxy is often very variable, the number of setae and their degree of development often showing great inconstancy within a species and between sexes (females normally have a stronger chaetotaxy and may show development of certain setae that are usually totally lacking in males), and also sometimes showing imperfect bilateral symmetry. Hence chaetotactic characters must be used with great caution and long series of specimens require study before any conclusions can be made about which setae, if any, are more or less dependable. The acrostichal, dorsocentral, intra-alar and supra-alar setae are, speaking generally, too inconstant in number and strength to be of real value in providing group characters or specific characters, and the sternopleural and posthumeral setae (especially the latter) show some variability which makes their usefulness limited (though the sternopleurals can usefully be used, and are here used, as a supporting character in defining the subgenera). The humeral callus has two moderately strong setae on the outer half in

nearly all specimens, and some *Rutilia* s.l. have one or two very fine humerals developed and distinguishable from the hair on the inner half of the callus as well; though a somewhat intangible character, it does seem that the setae on the inner half of the callus are almost never developed in the subgenus *Chrysorutilia*, whereas at least one and usually two humerals are (even if very fine) normally differentiated from the hair on the inner half of the callus in other subgenera.

An extremely important chaetotactic character among *Rutilia* s.l. is the number of strong setae on the postalar callus, and I find this to be one of the most useful characters that exists (on present knowledge) for dependably segregating the species into their respective subgenera. This feature of the chaetotaxy, whether there are three postalar setae or whether there are four (or more) such setae, provides an almost completely dependable character for distinguishing some subgenera from others—though very occasional specimens are found in which there are three postalars on one side and four on the other. If the species of *Rutilia* are assembled on the basis of their common possession of three and four postalar setae it is found that the resulting groupings appear without doubt to reflect a natural dichotomy within the genus, and that distinct taxa (subgenera) can then be defined on the basis of several other characters taken in combination with the postalar character. Omitting the small subgenera *Neorutilia* and *Ameniamima* subgen. n. (of which the affinities are rather obscure) the great bulk of *Rutilia* species are comprised here in the present re-classification in five subgenera, three in the section possessing the three postalar setae and two in the section with four such setae. The subgenera with three postalars (*Rutilia* s.str., *Microrutilia* and *Grapholostylum*) have a well developed anterior sternopleural seta, lack a hind tibial fringe, and have the hair of the supra-squamal ridge rather short and sparse, and are considered very closely allied; the subgenera with four postalars (or more) (*Donovanius* and *Chrysorutilia*) seem similarly close to each other (although their ♂ genitalia differ strikingly) and comprise forms without definite anterior sternopleural setae, with a well developed hind tibial fringe, and with extremely long thick bushy and often crinkled hair on the supra-squamal ridge. Distinctions between the seven subgenera recognized are emphasized in more detail in the treatment of each subgenus.

There is a strong tendency for the constituent species within each subgenus to have the same or similar type of colour pattern, though species may look superficially rather different because of different intensities of colour and of widely differing sizes. In *Rutilia* s.str. the predominant coloration is brown with little or no development of metallic colouring and no spot patterns, whereas in *Chrysorutilia* the species are rather homogeneously metallic green to blue-violet, with yellow heads and some coppery or blackish patterning or iridescence; in *Ameniamima* the colouring is green to purplish black, and both thorax and abdomen have a pattern formed of boldly marked white pollinose spots. A general indication of the range of colour and pattern, together with size, found in each subgenus has been given as an appendix to each of the subgeneric diagnoses.

The male genitalia and the form of the 5th (subgenital) abdominal sternite of the male provide some characters of taxonomic value at subgeneric and specific level, although very often groups of apparently distinct species have virtually

identical terminalia. Throughout most of the *Rutilia* s.l. species the male sternite 5 does not significantly differ from that of other Rutiliini, and has a simple bilobed form (Text-figs 30 & 31), but in two aggregations of species (here treated as the subgenera *Grapholostylum* and *Microrutilia*) the sternite is atypical: in *Grapholostylum* the sternite has exceptionally pointed outer sides and has a pair of curious blunt downwardly directed protuberances near the middle (Text-fig. 33); in *Microrutilia* the sternite is also very prominent in profile when in situ but does not have the submedian prominences and has each of the lateral lobes distinctly concave on its hind margin (Text-fig. 32).

The aedeagus in *Rutilia* s.l. is remarkably constant in structure and the only character found in it of any taxonomic use lies in the distiphallus. The distal membranous part of the distiphallus is normally shorter than, or at most subequal in length to, the sclerotized proximal part (Text-fig. 37), but in the subgenus *Grapholostylum* the distal membranous part of the distiphallus is much longer than in other *Rutilia* and has a slender whip-like form which is about twice as long as the sclerotized proximal part of the distiphallus (Text-fig. 38). The form of the cerci (mesolobes) does not differ very greatly in *Rutilia* s.l. species, although some specific differences are evident, and the cerci do not provide features of subgeneric value. On the other hand the shape of the surstyli (paralobes) differs conspicuously among different subgenera, being particularly distinctive in the subgenera *Donovanius* and *Chrysorutilia*. In *Donovanius* the surstyli are very enlarged and foliaceous in form (Text-figs 66–71) (enabling males of this subgenus to be recognized immediately the genitalia are examined), and in *Chrysorutilia* the surstyli (though varied in shape) always come to a fine sharp point at the apex (Text-figs 72–84). Other subgenera are less distinctive in genital form among their included species, but they all differ from *Donovanius* and *Chrysorutilia* by having differently shaped surstyli (i.e. by having neither the enormous foliaceous surstyli like *Donovanius* nor the sharply pointed mucronate surstyli like *Chrysorutilia*).

In *Rutilia* s.l. as a whole it is often difficult, unless a species has a particularly unusual form of male hypopygium, to determine the limits of species. Many of the apparent species have genitalia that are identical or nearly identical—for example, the many distinctive-looking entities considered to be species in the subgenus *Donovanius* actually differ not at all in their male genitalia, or if there are differences they are extremely subtle and of no practical use. Some of the colour characters that have been used to separate species, for instance whether the metallic areas of the abdomen are in spots or bands, seem to be undependable criteria for they fail to correlate very often with differences in male genitalia (particularly in the subgenus *Chrysorutilia* in which some species with very distinctive genitalia show the same or a very similar range of variation in colour pattern). Furthermore it seems possible that some species are polymorphic in respect of hair colour, so that some apparent species with yellow pleural hair may not be actually distinct from those with black pleural hair; and it also appears likely that some species may have black pleural hair in males but yellow pleural hair in females (similar to the sexual dimorphism in pleural hair colour found in some species of the higher Tachinid genus *Winthemia* Robineau-Desvoidy). At the present time no firm conclusions can be drawn on

these possibilities, so specific names are maintained as valid in the present work unless the types on which they are based show complete agreement in their characters (hair colour included). In taking this approach I have perhaps erred on the side of accepting too many nominal species as valid, but in the present state of knowledge it is better to do this than to establish synonyms on inadequate evidence of conspecificity.

KEY TO THE SUBGENERA OF *RUTILIA*

[*Note*: Occasional specimens may have four postalar setae on one side and three on the other: such specimens should be run as if four setae were present on both sides. *R. micropalpis* is subgenerically unplaced and will not therefore run out in the key (it is distinguished from all other *Rutilia* s.l. by the very reduced palpi and other characters noted on p. 92).]

- 1 Parafrontals non-pollinose, brilliant metallic green to blue-violet. Postalar callus with three setae. Hind tibia without anterodorsal fringe and without definite *ad* or *pd* setae. [Eastern Australia] . . . . . **NEORUTILIA** Malloch (p. 48)
- Parafrontals pollinose, either without metallic colour or with mere trace near vertex (except in species from Philippines but then four postalar setae). Postalar callus with either three or more setae. Hind tibia either with well developed close-set anterodorsal fringe or with some well developed *ad* or *pd* setae, or with both fringe and *pd* setae. . . . . 2
- 2 Suprasquamal ridge bare and postalar callus with four or five setae. Metallic green, blue to purplish black forms with bold white pollen spots on thorax and abdomen. [Eastern Australia] . . . . . **AMENIAMIMA** subgen. n. (p. 51)
- Suprasquamal ridge haired, or if bare then only three strong setae on postalar callus. Colour and pattern varied, but if bold white pollinose spots present then either three setae only on postalar callus or parafacials haired . . . . . 3
- 3 Postalar callus with four or more strong setae. Hind tibia with an anterodorsal fringe. One sternopleural seta ( $0 + 1$ ), at most only a very weak anterior sternopleural seta distinguishable among the hair. Hair of suprasquamal ridge long, dense and bushy, often crinkled and often extending on to basal depression of lower calypter . . . . . 4
- Postalar callus with three strong setae. Hind tibia without a definite anterodorsal fringe (occasional species with weakly developed or irregular fringe). Two or three sternopleural setae ( $1 + 1$  or  $2 + 1$ ), anterior *stpl* conspicuous amongst the sternopleural hair. Hair of suprasquamal ridge rather short and sparse, not noticeably crinkled and never extending on to base of lower calypter (lower calypter always entirely bare) . . . . . 5
- 4 Last abdominal tergite (*T*<sub>5</sub>) with a median depression and a median transverse row of strong erect setae. ♂ genitalia with very large broad foliaceous surstyli (Text-figs 66-71) without sharp pointed tip. Scutellum usually distinctly flattened and without distinct preapical setae in front of the marginal row. Pteropleural hairing not developed in front of the level of the posterior *stpl* seta (Text-fig. 20). Inner half of humeral callus with at least a trace of humeral setae distinguishable from the hair (humeral callus usually therefore with three or four distinguishable setae even if the innermost one or two are very weak). Head with dark ground colour. [Australia, Solomon Islands to Samoa] . . . . . **DONOVANIUS** Enderlein (p. 69)
- Last abdominal tergite (*T*<sub>5</sub>) evenly convex across its width, without median depression or at most with only a mere trace of apicomedian hollowing; *T*<sub>5</sub> normally without any development of strong setae, vestiture composed only of fine erect hair (some setae present in species from Philippines, and some other species occasionally with some of the erect hair stronger than remainder). ♂ genitalia

with elongate surstyli which end in a sharp pointed tip (Text-figs 72-84). Scutellum convex and with an irregular row of small but definite horizontal preapical setae in front of the marginal setae. Pteropleuron haired on the anteroventral part in front of the level of the posterior *stpl* seta (Text-fig. 19). Inner half of humeral callus without setae developed amongst the hair (humeral callus therefore only with the two setae on the outer half). Head usually with bright yellow ground colour. [Widespread in Oriental and Australasian Regions]

**CHRYSORUTILIA** Townsend (p. 54)

- 5 Last abdominal tergite (T<sub>5</sub>) with a median depression. Abdominal T<sub>3</sub> with a transverse row of at least a few, usually many, strong erect spiniform marginal setae. Scutellum distinctly flattened or slightly hollowed before the apex. Suprasquamal ridge bare or haired. Arista micropubescent. Setae of inner ventral ends of abdominal tergites rather strong and directed downwards as well as backwards. ♂ sternite 5 with normal simple lobes. [Australia]

**RUTILIA** Robineau-Desvoidy s.str. (p. 77)

- Last abdominal tergite (T<sub>5</sub>) without a median depression, the upper surface evenly convex or at most with only a trace of flattening at the tip. Abdominal T<sub>3</sub> without a transverse row of marginal setae, or if a row present then the setae not markedly spiniform. Scutellum evenly convex on upper surface. Suprasquamal ridge haired. Arista long-pubescent to short-plumose. Marginal setae of tergite venters usually weak or hair-like and nearly completely recumbent (not projecting noticeably downwards). ♂ sternite 5 atypical, shaped either as in Text-fig. 32 or as in Text-fig. 33 . . . . . 6

- 6 ♂ sternite 5 as in Text-fig. 33, the sternite very strongly acuminate on each side and provided with a pair of submedian downwardly directed protuberances. Distal membranous part of ♂ aedeagus exceptionally long and whip-like (about twice as long as the sclerotized proximal part of distiphallus, Text-fig. 38). Only one posterior intra-alar seta (exceptionally a small second seta present in front of main one). ♀ normally without, or with one pair of, proclinate orbital setae. Thorax with distinct white pollinose areas (often forming bold white spots) over mesopleuron, sternopleuron, humeral callus and supra-alar area of scutum. [Tasmania to Queensland]

**GRAPHOLOSTYLUM** Macquart (p. 83)

- ♂ sternite 5 as in Text-fig. 32, the sternite without such acuminate sides and without a pair of submedian protuberances. Distal membranous part of ♂ aedeagus normal in size, shorter than proximal sclerotized part of distiphallus (Text-fig. 37). Normally two *post ia* setae (but only one in occasional specimens). ♀ normally with two pairs of proclinate orbital setae (occasionally one or none). Thorax without distinct white pollinosity and therefore lacking bold white spots. [Tasmania to Queensland; one undescribed species seen from New Guinea]

**MICRORUTILIA** Townsend (p. 86)

Subgenus **NEORUTILIA** Malloch

*Neorutilia* Malloch, 1936 : 17. Type-species: *Rutilia* (*Neorutilia*) *simplex* Malloch, 1936, by original designation. (As subgenus of *Rutilia* Robineau-Desvoidy, 1830).

DIAGNOSIS. Parafrontals metallic (hardly at all pollinose). Epistome metallic; genal dilations entirely metallic (trace of thin pollinosity in some lights). Facial carina flattened on outer surface, strongly contracted ('pinched-in') ventrally in ♀, not separated from lunula by distinct depression. Parafacials bare. ♀ without proclinate orbital setae. Arista bare (unusually long and slender). Humeral callus with 4-5 setae. Posthumeral setae absent in ♂, variably 2-3 in ♀ (one near inner edge of humeral callus and at least one near presutural seta). One *post ia* seta in ♂, one or two small *post ia* setae in addition to main one in ♀. Scutum with super-numerary prescutellar setae, forming in all a transverse row of about 12 very strong stiff setae

immediately before scutellum. Postalar callus with 3 strong setae. Suprasquamal ridge thickly haired. Scutellum strongly flattened, rather thin; with 7-8 pairs of marginal setae (these very strong, stiff and straight); with a row of small irregular preapical setae, these very feebly developed in ♂. Haired area of lower part of pteropleuron *not* extending in front of level of posterior sternopleural seta. One sternopleural seta (0 + 1). Prosternum and prosternal membrane bare. Hind tibia without definite anterodorsal fringe and without *ad* setae, *pd* seta absent in ♂ but one present in ♀ (latter may have very weak second *pd* setula). Last abdominal tergite broad and with large depression. T<sub>3</sub> without median or lateral marginal setae. T<sub>5</sub> with transverse median regular row of long strong erect setae. Surstyli of ♂ genitalia simple elongate lobes (Text-fig. 59). [Bright green to violaceous blue species with metallic parafrontals and genae and blackish hind margins to abdominal tergites].

**DISTRIBUTION.** Known only from eastern Australia from Victoria to Queensland.

**DISCUSSION.** Malloch erected *Neorutilia* as a subgenus of *Rutilia* for the single aberrant species *simplex* Malloch. This is a curious and isolated species showing an unusual combination of characters which prevent it from being assigned satisfactorily to any other subgenus, and I therefore agree with Malloch in placing *simplex* separately from other *Rutilia* and am recognizing *Neorutilia* as a valid subgenus; no other species fitting into the concept have been described.

The metallic blue or green parafrontals, epistome and genal dilations make *simplex* a unique species amongst the whole *Rutilia* fauna of Australia, and it is therefore very easily identified, but very similar forms superficially—having the same type of largely metallic head, similar coppery green to blue-violet body colour, and even the same knob-like development of the hind part of the notopleuron—are to be found in the *luzona*-group of *Chrysorutilia* from the Philippines. This superficial resemblance is so strong that I at first inclined to believe that *simplex* and the Philippine species referred to must have strong affinity and perhaps be consubgeneric, but detailed examination of the whole constellation of body characters shows convincingly that the resemblances are convergent. The *luzona*-group has the features of true *Chrysorutilia* such as the presence of strong hairing on the prosternal membrane and forward edge of the prosternum itself, loss or non-development of the inner setae of the humeral callus, no depression in the last abdominal tergite, extended area of hairing forwards on the lower pteropleuron, no supernumerary prescutellar setae, four or more postalar setae, convex scutellum, and long regular hind tibial fringe: in *simplex*, however, these characters of *Chrysorutilia* are not found, and *Neorutilia* differs from *Chrysorutilia* by having bare parafacials, bare prosternal membrane and prosternum, inner humeral setae developed, strong supernumerary prescutellars developed, only three postalar setae, extremely flattened scutellum, pteropleural hairing not extending forwards of the sternopleural seta, no hind tibial fringe (or extremely short and inconspicuous), and a well developed depression in T<sub>5</sub>.

In several of the characters just cited *Neorutilia* resembles the subgenus *Donovanius*—for example both subgenera have setae on the inner part of the humeral callus, lack pteropleural hair anterior to the sternopleural seta, have a very broad abdominal T<sub>5</sub> with large median depression, and have the scutellum distinctly flattened—but it is doubtful whether there is any close relationship between the two. *Neorutilia* differs from *Donovanius* in having only three postalar setae, largely

metallic head, only one *stpl* seta and no hind tibial fringe; the hairing of the suprasquamal ridge is also much longer, more bushy and crinkly, than in *Donovanius* (in which respect *Neorutilia* agrees with *Chrysorutilia*). The hairing of the suprasquamal ridge at once separates *Neorutilia* from *Ameniamima* subgen. n., from which it also differs by the pteropleural character, the metallic head, the three postalars, the lack of white pollinose spots, the flattened scutellum and the supernumerary prescutellar setae.

In *simplex* the presence of very strong supernumerary setae on the scutum immediately in front of the scutellum is a striking feature; it is difficult to distinguish which actual setae are the supernumeraries and which are the true hindmost setae of the dorsocentral and acrostichal rows, for together the setae (which are all unusually strong, rather straight and thick) form a transverse row of more or less homogeneous setae (very much resembling then the transverse rows of prescutellar setae formed in a similar way in many species of *Formosia* or in occasional species of *Rutilia* (*Donovanius*) such as *sabrata* (Walker)). Development of such supernumerary prescutellars appears to occur rather haphazardly in unrelated groups of Rutiliines.

It does not seem likely that *Neorutilia* has any close relationship with the other subgenera possessing only three postalar setae, *Rutilia* s.str., *Grapholestylum*, and *Microrutilia*, for apart from this character and the lack of the hind tibial fringe it has little in common with these subgenera, differing from them greatly in general appearance, metallic head, one *stpl* seta, flattened scutellum, supernumerary prescutellar setae, and the long thick suprasquamal hairing (in contradistinction to the rather short sparse ridge hairing found in *Rutilia* s.str. or *Grapholestylum*).

Apart from the characters cited in the diagnosis and discussed comparatively above there are some other curious features found in *simplex* that require comment. The facial carina seems, from the small number of specimens so far available, to be unusually sexually dimorphic, being much longer and more strongly pinched-in towards the lower end in the female than in the male, and the antennae of the female to be correspondingly longer than those of the male. There is also something 'different' about the facies of the head when seen in facial view that is hard to define in words or to figure satisfactorily but is associated with the fact that the lower ends of the facial ridges are more flattened than is usual in *Rutilia* s.l. and more extensively haired; normally in *Rutilia* there are only one or two irregular series of hairs on the facials laterad and ventrad of the main vibrissae, but in *simplex* there are some three or four irregular series of rather small hairs. Another unusual feature is the nature of the arista, which is exceptionally long and fine and is virtually totally bare; in all other *Rutilia* the arista is obviously more thickened on much of its length and is always conspicuously pubescent or sometimes even short-plumose. The claws are shorter than in most other species of the genus, and the fore tarsi are shorter than in all other species. Malloch (1936) pointed out in the original definition of *Neorutilia* and description of *simplex* that the section of the costa between the apex of the subcosta and the first vein (second costal sector) is subequal in length to the section between the apex of the first vein and apex of the second vein (third costal sector), and remarked that he had not seen other species with similar costal

divisions. Although I have not used this feature in the subgeneric diagnoses, it is true of all material that I have seen that the second and third costal sectors in *simplex* are subequal in length whereas in all other *Rutilia* the second sector is obviously appreciably shorter and often very much shorter than the third sector; certainly this is one of the characters along with the others already alluded to that make *simplex* a very atypical *Rutilia*, and one best placed in a separate subgenus.

#### INCLUDED SPECIES

*Rutilia (Neorutilia) simplex* Malloch. AUSTRALIA (New South Wales, Queensland, Victoria). [Holotype examined].

#### Subgenus *AMENIAMIMA* subgen. n.

Type-species: *Rutilia argentifera* Bigot, 1874.

DIAGNOSIS. Parafrontals thickly pollinose. Epistome not metallic, genal dilations thickly pollinose. Facial carina flattened on anterior surface, sides subparallel or slightly widened near base of third antennal segment, not separated from lunula by distinct depression; epistome rather strongly prominent. Parafacials bare. ♀ without proclinate orbital setae or with one pair. Arista pubescent. Humeral callus with 3-4 setae, innermost one well developed (especially in ♀). Posthumeral setae usually absent in ♂ or one distinguishable from hair near inner edge of humeral callus, 2-4 rather strong but irregular in ♀ (if more than two then one of the *ph* standing near to presutural seta). One or two *post ia* setae. Scutum without supernumerary prescutellar setae. Postal callus with 4-5 strong setae. Suprasquamal ridge bare. Scutellum not flattened, dorsal surface evenly convex; with 3-6 pairs of marginal setae (these not stiffened); marginal setae preceded by irregular row of distinct preapical setae (very well differentiated from scutellar hairing). Haired area of lower part of pteropleuron extending well forwards of the posterior *stpl* seta. Normally two sternopleural setae (1 + 1), anterior one weak in ♂ and sometimes not differentiated in this sex (aberrant ♀ specimen seen with doubled posterior *stpl*). Prosternum and prosternal membrane bare. Hind tibia without definite anterodorsal fringe and with one submedian *ad* seta (except in *cingulata* ♂ which has moderately developed regular *ad* fringe), with one or two *pd* setae. Last abdominal tergite (T<sub>5</sub>) with a very small median apical depression in ♂ (not longer than half tergite length at most) and without any definite apical depression in ♀. T<sub>3</sub> without median marginal setae (occasionally a few developed in ♀) and with lateral marginal setae. T<sub>5</sub> with a transverse row of long strong erect setae on apical half, sometimes whole posterior half of T<sub>5</sub> in ♂ bristled with many very long strong irregularly arranged setae. Surstyli of ♂ genitalia in form of broad lobes (Text-fig. 58). [Bright green, cupreous, or blue to purplish black forms with bright orange-yellow heads, and discrete bold white pollinose spots on thorax and abdomen, showing strong resemblance to calliphorid flies of genus *Amenia* Robineau-Desvoidy].

DISTRIBUTION. Australia only, from Victoria to Queensland (not seen from Western Australia, South Australia, or Tasmania).

DISCUSSION. The new subgenus *Ameniamima* is here erected for a small group of eastern Australian species of *Rutilia* s.l. which show a quite remarkable convergent resemblance in body form, colour and pattern, to flies of the Australian genus *Amenia* Robineau-Desvoidy (Calliphoridae). Four nominal species of this group have been described, but each is known from only very little material and it is not certain that all four names actually denote distinct species; one is here placed as a new synonym.

*Ameniamima* includes all the species of *Rutilia* s.l. in which the suprasquamal ridge is bare and there are more than three postalar setae (elsewhere in *Rutilia* s.l. the few species with bare ridge have only three postalars). The metallic green or blue colouring that is typical in *Ameniamima*, combined with the bright orange-yellow head, give the species a superficial resemblance to some *Chrysorutilia* species, and it is possible that it is to this latter subgenus that *Ameniamima* is most closely related; the two subgenera share such features as the presence of four or five postalar setae, the haired area of the lower pteropleuron extending well forwards of the level of the posterior sternopleural seta, the presence of a definite irregular transverse row of semi-horizontal preapical scutellar setae in front of the marginals, similar general shape of facial carina, and similar lack of a definite median depression in the last abdominal tergite (though a small depression is present at the tip of the tergite in *Ameniamima* males). The main differences between *Ameniamima* and *Chrysorutilia*, apart from the bare suprasquamal ridge in the former and densely haired ridge in the latter, include the following: parafacials, prosternum and prosternal membrane bare in *Ameniamima* (partly or entirely haired in *Chrysorutilia*); inner half of humeral callus with one or two humeral setae developed in addition to the pair on the outer half of the callus in *Ameniamima* (only the outer pair present in *Chrysorutilia*); hind tibia usually without definite fringe in *Ameniamima* (with long close-set regular fringe in *Chrysorutilia*); abdominal T5 with long strong setae in *Ameniamima* (only with fine hairing in *Chrysorutilia*, except for some weak erect bristling in Philippine forms). In addition the chaetotaxy is generally much stronger in *Ameniamima* than in *Chrysorutilia*, especially the bristling of the mesonotum, the outermost humeral setae, and the posterodorsal setae of the hind tibia. The head of *Ameniamima* species is almost entirely thickly yellow pollinose over the yellow ground colour, only the extreme upper parts of the occiput being bare or metallic, and the completely pollinose genal dilations and postbuccae will at once distinguish specimens of the subgenus from *Chrysorutilia* (in which all species have these areas of the head largely bare or metallic and at most only thinly pollinose).

The body colour in *Ameniamima* ranges from brilliant metallic green (sometimes with brassy or coppery tinge) to blue, violet and purplish black; in one species, *cingulata*, the colour is virtually black except for violet tinges near the pollinose spots and metallic silvery blue colour underlying a thick whitish pollinosity on abdominal T3. All the species possess well developed, conspicuous and rather discrete, spots of thick white pollinosity, those of the abdomen having a slightly shifting appearance with the light. The spot pattern consists of paired white spots in these positions: humeral; supra-alar; mesopleural; sternopleural; ventrolateral on abdominal T3, T4, and T5; dorsolateral on T3; submedian on T4 and T5. In addition there is usually a pair of submedian white pollinose vittae variously developed on the prescutum, and in a few specimens (including the lectotype of *argentiifera*) there is a trace of an evanescent pair of submedian spots on T3. Usually the dorsolateral spots of T3 and the submedian spots of T5 are more or less merged with the ventrolateral spots of their respective tergites. In the male of *cingulata*, which conforms to the basic plan of the pattern, the supra-alar spots and the submedian spots of T4 and T5 are rather small but the white pollinosity is so extensively developed on

the ventrolateral and dorsal parts of T<sub>3</sub> that it forms an almost complete band around the whole of this tergite and in dorsal view completely conceals the metallic blue ground colour of this tergite.

A white-spotted pattern of the type just described does not occur in quite the same way in other subgenera of *Rutilia* s.l., although some of these contain individual species in which there is some development of a white-spot pattern with a superficial resemblance to that of *Ameniamima*, for example an undescribed species of subgenus *Chrysorutilia* in which the thoracic spotting is the same except for lack of definite sternopleural spots and in which the abdomen has ten small sharply-defined silvery white spots on a purplish black background (four spots in a transverse row on each intermediate tergite, and paired lunate spots on the last tergite); two species of *Grapholostylum* have a pattern of whitish spots, viz. *albovirida* Malloch and *dorsomaculata* (Macquart), but in these species there are *ventral* spots or pollinose areas on the tergites and a pair of submedian spots on the scutum which are not found in *Ameniamima*. The resemblance, however, between the spot-pattern of *Ameniamima* and of the Calliphorid fly genus *Amenia* is extraordinarily exact, and the former name here proposed for a subgenus of *Rutilia* alludes to this fact as well as to the other many similarities by which *Ameniamima* counterfeits *Amenia*.

The astonishing convergent resemblance between Rutiliini and Ameniinae (Calliphoridae) was already recognized in an inchoate way as early as 1830, when (as Crosskey (1965 : 41) has pointed out) Robineau-Desvoidy realised that it was by an error that he had placed the Ameniine species *Amenia leonina* (Fabricius) in *Rutilia* when the latter was first described. Since then several workers have commented on the resemblance and some have been misled into uniting the Ameniines with the Rutiliines, mainly because of the common possession of a large facial carina and the same range of colour and pattern; Enderlein (1936) named the Ameniine genus *Formosiomima* for a species seemingly mimicking the black-and-white pattern of *Formosia speciosa* (Erichson). It is now established beyond any doubt that the Ameniines, with their Calliphorid type of male genitalia (completely unlike the Prosenine Tachinid genitalia with the extraordinarily elongate slender aedeagus) and other Calliphorid characteristics are not Tachinidae (see Crosskey (1965)), and hence that the resemblances are due to convergence. These resemblances reach their apogee amongst the species of *Rutilia* here placed in the subgenus *Ameniamima* and in the species of *Amenia* Robineau-Desvoidy, in which it almost seems as though individual species have their respective counterparts: bright green specimens of *R. (A.) argentifera* have their counterpart in *Amenia imperialis* R.-D., while *R. (A.) quadripunctata* (Malloch), which is often more blue, resembles *Amenia leonina* (Fab.). However, all the *Amenia* species have a pair of silvery white pollinose spots in a postalar position (partly overlying the postalar callus and partly the hind scutal border) which are always absent in *Rutilia* s.l.

Three of the nominal species included in the present subgenus were placed by Malloch (1929, 1930) when originally described in the genus *Formosia* because of the bare suprasquamal ridge, a character which Malloch rather rigidly regarded as absolutely dependable for separating *Formosia* from *Rutilia*; reliance on this character alone induced Malloch to place the three 'bare ridge' species here included, and

also *confusa* Malloch (a species of *Rutilia* s.str. with bare suprasquamal ridge), out of *Rutilia* to which they so obviously fit well on the total facies provided by all their other characters and into *Formosia* (with which, apart from the bare ridge, they have little in common). The oversimplified picture provided by Malloch's conception of two genera *Formosia* and *Rutilia* always clearly separable by the ridge vestiture character is not justified when all characters are correlated, and the species here forming the subgenus *Ameniamima* are considered in this revision to belong to *Rutilia* s.l. in spite of the exceptional feature of lacking hair on the suprasquamal ridge.

Note should be made here of Malloch's (1928a : 333; 1929 : 297; 1930 : 107) misidentification of *Rutilia argentifera* Bigot. The true *argentifera* Bigot with bare prosternal membrane, bare parafacials and bare suprasquamal ridge, is the species here designated as type-species of *Ameniamima* subgen. n. and is not the species called *argentifera* by Malloch (who did not see Bigot's types and whose citations given above to this species are all based on misidentifications). Malloch's species to which he applied Bigot's name has the prosternum hairy (see Malloch's 1928a : 333 key) and the parafacials haired (Malloch 1929 : 297-298), and also has the suprasquamal ridge hairy (otherwise he would have placed it in *Formosia*), and is clearly a species of the subgenus *Chrysorutilia*.

#### INCLUDED SPECIES

- Rutilia (Ameniamima) argentifera*** Bigot. AUSTRALIA (New South Wales, Queensland). [Lectotype examined].  
*frontosa* (Malloch) **syn. n.** [Holotype examined].  
***R. (A.) cingulata*** (Malloch). AUSTRALIA (New South Wales). [Holotype examined].  
***R. (A.) quadripunctata*** (Malloch) **comb. n.** AUSTRALIA (Queensland, Victoria). [Holotype examined].

#### KEY TO SPECIES OF THE SUBGENUS AMENIAMIMA

- 1 Postorbits entirely bright yellow pollinose and concolorous with rest of the yellow head. ♂ surstyli as in Text-fig. 58 . . . . . ***R. argentifera***
- Upper two-thirds of the postorbits silvery white pollinose and contrasting in colour with rest of the yellow head. [Genitalia of ♂ not examined] . . . . . 2
- 2 Third abdominal tergite (i.e. apparent second segment) almost completely covered with dense white pollinosity, so that abdomen shows a broad pale transverse sub-basal band which strikingly contrasts with remainder of dark abdomen (silvery bluish glints visible through the pollinosity in some lights). General body colour dark purplish black with very dark brown non-metallic scutellum. [Known only from ♂ holotype, ♀ may not conform] . . . . . ***R. cingulata***
- Third abdominal tergite not so, with only two small inconspicuous spots of whitish pollinosity with shifting appearance on each side, T<sub>3</sub> therefore appearing unicolorous with rest of abdomen. General body colour blue-green to deep violet-blue, scutellum distinctly metallic . . . . . ***R. quadripunctata***

#### Subgenus **CHRYSORUTILIA** Townsend **stat. n.**

*Chrysorutilia* Townsend, 1915 : 23. Type-species: *Rutilia formosa* Robineau-Desvoidy, 1830, by original designation.

- Philippoformosia* Townsend, 1927 : 282. Type-species: *Philippoformosia splendida* Townsend, 1927 [= *townsendi* Crosskey, **nom. n.**], by original designation. **Syn. n.**
- Habrota* Enderlein, 1936 : 399. Type-species: *Rutilia formosa* Robineau-Desvoidy, 1830, by original designation. [Isogenotypic name with *Chrysorutilia* Townsend].
- Zoramseus* Enderlein, 1936 : 416. Type-species: *Rutilia erichsonii* Engel, 1925 [= *Dexia chersipho* Walker, 1849], by original designation. **Syn. n.**
- Idania* Enderlein, 1936 : 408. Type-species: *Idania atrox* Enderlein, 1936, by original designation. **Syn. n.**
- Formotilia* Paramonov, 1968 : 355. [Name published in footnote to generic key: unavailable under Article 13 (b) of *International Code of Zoological Nomenclature*, no fixation of type-species.]

**DIAGNOSIS.** Parafrontals pollinose (except *luzona*-group and *atrox*). Epistome not metallic (except *luzona*-group). Genae with the dilations partly or entirely metallic, without or with very thin pollinosity (golden green to blue, except dark brown in *atrox*). Facial carina conspicuously flattened on anterior surface, sides subparallel or slightly divergent ventrally, separated from lunula by weak depression. Parafrontals haired. ♀ without proclinate orbital setae. Arista micropubescent. Humeral setae reduced, 2 on outer half of callus only (at most only minute hair-like inner humerals developed). Posthumeral setae absent. *Post ia* setae normally one each side, occasionally absent (rarely two in ♀). Scutum without supernumerary prescutellar setae. Postalar callus with 4–6 strong setae. Suprasquamal ridge thickly haired. Scutellum not flattened or at most with only slight flattening at apex; with 4–7 pairs of marginal setae (these rarely stiffened); marginal setae preceded by an irregular row of horizontal pre-apical setae clearly differentiated from scutellar hair. Haired area of lower part of pteropleuron extending well forwards of the posterior *stpl* seta. One sternopleural seta (0 + 1), sometimes one or two small wiry anterior sternopleurals developed in ♀; rarely sternopleurals quite absent. Prosternum haired on anterolateral corners; prosternal membrane haired (hair often long and conspicuous). Hind tibia with long regular anterodorsal fringe (no evident *ad* setae), without or with one or two very weak *pd* setae. Last abdominal tergite (T5) without median depression, convex on upper surface. T3 without median marginal setae (rarely weak setae present in ♀) and without lateral marginals. T5 with fine erect hair only (sometimes some more strongly developed slightly setiform vestiture at apex; irregular erect stubby setae in *luzona* ♂). Sternite 5 of ♂ with simple rounded lobes. ♂ genitalia with distal membranous part of distiphallus shorter than, or at most subequal in length to, the sclerotized proximal part; surstyli much longer than wider, sometimes with blunt projection or long tooth anteromedially, always with sharp pointed tip that is directed more or less forwards (Text-figs 72–84). [Mainly metallic golden-green, coppery, or blue-green forms with banded or spotted abdomen and yellow head ground colour, often with white pollinose areas on thorax but these very rarely forming bold discrete spots.]

**DISTRIBUTION.** Widespread throughout Oriental and Australasian regions, the distribution including Ceylon, India, Vietnam, Philippines, Timor, Western Australia (including Monte Bello Islands), all of eastern Australia and Tasmania, the Kei Islands, New Hebrides and Lord Howe Island.

**DISCUSSION.** *Chrysorutilia* is the largest subgenus of *Rutilia* s.l. and has a wider geographical distribution than any other subgenus; it includes some two-fifths of the described species (though some of the names accepted as valid might prove to be synonyms) and is the only segregate of *Rutilia* s.l. represented on the mainland of Asia. The subgenus is poor in number of species in the Oriental Region, and those that do exist in this area appear to be uncommon to judge from the paucity of specimens in museum collections; the occurrence of the subgenus in Asia appears to be due to dispersal from a centre of evolution in Australia, and the forms found

in the New Hebrides and Lord Howe Island (whose specific identities are doubtful at present) probably also reached these locales from Australia itself.

The subgenus is perhaps better characterized than the other subgenera and there is usually no difficulty in deciding whether any described species does or does not fit into *Chrysorutilia*. The subgenus includes all the *Rutilia* species that have bright yellow heads and hairy parafacials, and it is a useful rule-of-thumb that specimens showing these characteristics in combination must belong to species of *Chrysorutilia*; however, there are a few species which evidently belong in this subgenus in which the head is not bright yellow (even *formosa*, the type-species, has the head colour slightly brownish rather than yellow) and a few very curious forms from the Philippines in which the body is entirely blackish brown (*atrox* Enderlein) or in which the parafrontals are bare and brilliant metallic green or blue (*luzona* Enderlein and *splendida* Townsend). These Philippine species are discussed further below, as two of them are type-species of generic names which are here treated as synonyms of *Chrysorutilia*.

The characteristics which separate *Chrysorutilia* from *Donovanius* and *Ameniamima* are discussed in the treatments of these subgenera and need not be detailed here, but some unusual features of *Chrysorutilia* are worthy of special note. A curious character of the subgenus is the unusually long and conspicuous hair to be found on the membranous areas of the prosternal region, and anteriorly on the edge of the prosternal plate itself; hair on the membrane occurs in many *Donovanius* species and occasionally in *Grapholostylum*, but in these subgenera is usually sparse and not very obvious, while they never have hair actually on the edge of the prosternum, whereas in *Chrysorutilia* both membrane and plate bear hair and that on the membrane is sometimes strong and black and immediately obvious (providing the head of the specimen is set forward sufficiently clear of the lower thorax). Prosternal membrane hair of this strong black type occurs on the types of *Idania atrox* (type of *Idania*) and *Philippoformosia splendida* Townsend (type of *Philippoformosia*), and conformity of this character (as well as other essential features) suggests that these Philippine species should be treated as consubgeneric with typical *Chrysorutilia*; hence *Idania* and *Philippoformosia* are here placed as new synonyms of *Chrysorutilia*.

*Idania* and *Philippoformosia* agree, too, with *Chrysorutilia* in other essential features of the subgenus such as the rounded non-sulcate last abdominal tergite, the haired area of the pteropleuron extending well forwards of the posterior sternopleural seta, the weak development of humeral setae (only two setae on the outer half of the callus), the total lack of posthumeral setae, the extremely well developed hind tibial fringe, the very bushy tuft of rather long crinkly hair on the suprasquamal ridge, and the presence of distinct preapical setae on the scutellum just in front of the marginals. However, there are some obvious minor differences between the Philippine species and typical *Chrysorutilia* and they are here placed in separate species-groups from the main bulk of the species; the groups are keyed out and defined immediately after this discussion section.

Hairing of the suprasquamal ridge is developed to its greatest extent among the Rutiliini in this subgenus. In all *Chrysorutilia* species the hair of the ridge is very

long and dense and forms a very conspicuous bushy tuft in which the individual hairs are often rather crinkled apically (Text-fig. 24); in some of the species the hairiness extends on to the base of the lower calypter. Hairing of the lower calypter occurs, so far as I know, nowhere else in the Rutiliini, but as it is not at all consistent throughout *Chrysorutilia* it has not been cited as a character either in the subgeneric key or the diagnosis; nevertheless it can be a useful feature in recognizing, or helping to distinguish, some species. In the smaller species of *Chrysorutilia* the lower calypter is usually completely bare or has only a very few hairs at the extreme base adjacent to the suprasquamal ridge, but in some of the larger species such as *R. (C.) splendida* (Donovan) the whole basal depression of the calypter has conspicuous erect dark hair on the upper surface; in *R. (C.) cryptica* sp. n. half the surface of the lower calypter or more is hairy.

In *Chrysorutilia* the genal dilations of the head are much more extensively metallic, because they are only very thinly pollinose or because they are bare, than in the other subgenera; in other *Rutilia* s.l. the lower parts of the head are thickly pollinose (except in *Neorutilia*) and only the postbuccal regions at most have any trace of metallic colouring. In *Chrysorutilia* at least the posterior half and sometimes the whole of the genal dilation is shining golden green, cupreous, blue-green or blue-violet, at least in some lights. In the *luzona*-group even the epistome is largely shining golden green to steely blue and only very thinly pollinose, and there are bare shining parafrontals. Hairing of the parafacials is more developed than in other *Rutilia* s.l., and the males of many *Chrysorutilia* species have specially dense hair which reaches to the bottom end of the parafacials, to a point about level with the bottom-most point of the eye seen in profile; when hairy parafacials occur in other subgenera the hairing normally does not reach so far down on the parafacials. The facial carina in *Rutilia* s.l. reaches its most wide and flattened condition in *Chrysorutilia*, with the result that the antennae in this subgenus tend to be distinctly more widely separated at their insertions than is normally the case in other forms; normally the carina is exceptionally parallel-sided, tending not to widen at a level with the base of the third antennal segment as in other subgenera, and often it even widens noticeably towards the ventral end.

Three species-groups are recognized in *Chrysorutilia* and can be distinguished by the following key:

#### KEY TO THE SPECIES-GROUPS OF *CHRYSORUTILIA*

- 1 Body extensively metallic, gold-green or cupreous to blue-violet . . . . . 2
- Body uniformly blackish brown, not metallic, at most only slight trace of purplish tinge on abdomen. [Philippines] . . . . . **atrox**-group (p. 58)
- 2 Parafrontals and epistome metallic. Two posterior notopleural setae on unusually strongly developed (almost knob-like) protuberance. [Philippines] . . . . . **luzona**-group (p. 58)
- Parafrontals and epistome not metallic. Notopleuron normal, with one posterior seta and hind part of notopleuron only slightly protuberant. [Not known from Philippines] . . . . . **formosa**-group (p. 59)

THE *ATROX*-GROUP

DIAGNOSIS. Body blackish brown with at most only very faintest metallic purplish tinge on abdominal tergites. Parafrontals non-pollinose, but not metallic. ♂ claws rather short and thick. [Character of notopleural setae uncertain, one posterior seta on one side and two on other in *atrox* holotype, only specimen known.] Last abdominal tergite with preapical transverse row of fine long erect setae differentiated from the hair.

This group contains only one species which Enderlein (1936) made the type-species of his genus *Idania*. Though this species, *atrox*, is strikingly different from all other *Chrysorutilia* because of the unicolorous dark mahogany-brown to blackish brown colouring it agrees in all its essential features with the more typical species of *Chrysorutilia* and I unhesitatingly place it in this subgenus (*Idania* thus sinking as a synonym). At present, only the holotype of *atrox* is known; in some lights the specimen shows very faint traces of purple on the abdomen, and the genae and parafrontals—although brown and non-metallic—are seen to be devoid of definite pollinosity (*atrox* in this respect resembling *luzona*-group). The holotype shows extremely well developed long black hair on the prosternal membrane and some shorter fine hairs on the front of the prosternum, much as in *luzona*-group, and the hind tibial fringe is extremely well developed; it is a large specimen measuring some 20 mm in length with slightly infusate wings in which the veins of the middle region, especially anteriorly, are conspicuously yellow. It is possible that intermediate forms will ultimately be discovered which interconnect *atrox* with the *luzona*-group, in which case the two groups could be merged under the latter name; at present both groups are found only in the Philippines, an area from which typical *Chrysorutilia* species (*formosa*-group) are not yet known.

## INCLUDED SPECIES

***Rutilia (Chrysorutilia) atrox* (Enderlein) comb. n.** PHILIPPINES. [Holotype examined].

THE *LUZONA*-GROUP

DIAGNOSIS. Body largely golden green to dark blue; parafrontals, epistome and genal dilations metallic. ♂ claws rather short and thick. Notopleuron with posterior part extraordinarily protuberant and with two setae (notopleuron therefore with total of three setae). Last abdominal tergite with transverse preapical row of long setae differentiated from the hair.

It is to this group that Townsend (1927) applied the name *Philippiformosia*, a genus based on *splendida* Townsend from the Philippines. As with *atrox* (above), it seems to be that *splendida* Townsend has all the main characters shown by *Chrysorutilia* and I therefore place the generic name based upon it as a synonym; however, *splendida* together with *luzona* Enderlein differs from typical *Chrysorutilia* by the features mentioned in the diagnosis above and separate species-group status within *Chrysorutilia* is considered to be the most appropriate taxonomic treatment. Unfortunately *splendida* Townsend is known only from the female holotype and *luzona* only from the male holotype, and it is therefore difficult to be certain whether two distinct species actually occur; *luzona* should perhaps be placed as a synonym of *splendida* Townsend, but for the present it appears best to maintain the names for

valid species pending more evidence. The name *splendida* Townsend, being herein applied to a species of *Rutilia* s.l., becomes a junior secondary homonym of *R. splendida* (Donovan), and the name *townsendi* is therefore here proposed for the pre-occupied *splendida* Townsend (the new name will enter synonymy with *luzona* Enderlein if it is later shown that the types of *splendida* Townsend and *luzona* Enderlein are conspecific).

The BMNH collection contains two females of this group in rather bad condition that were formerly in Bigot's collection and are from an unknown locality (though Philippines seems probable). These females were the specimens for which the late Dr Paramonov had intended formally to erect the genus *Formotilia*, and which were the basis for the entry 'gen.nov. No. 2' and the footnote giving the published name *Formotilia* in his posthumous paper (Paramonov, 1968); one of the specimens bears a name label in Paramonov's writing on which the generic name *Formotilia* is given. This name, though published, is unavailable in nomenclature (no fixation of a type-species), but the existence of the specimens in BMNH which were seen and labelled by Paramonov enables the name *Formotilia* to be placed. It clearly applies to the *luzona*-group here defined and if ever validated nomenclaturally would be a synonym of *Philippoformosia*.

#### INCLUDED SPECIES

***Rutilia (Chrysorutilia) luzona* (Enderlein) comb. n.** PHILIPPINES. [Holotype examined].

***R. (C.) townsendi* nom. n.** PHILIPPINES. [Holotype of *splendida* examined].  
*splendida* (Townsend) [Junior secondary homonym in *Rutilia*].

#### THE FORMOSA-GROUP

**DIAGNOSIS.** Body partly or largely metallic, golden green to blue violet; parafrontals and epistome not metallic, genal dilations partly or largely but not completely metallic. ♂ claws long and slender. Notopleuron normal, posterior part not exceptionally protuberant and with one seta. Last abdominal tergite with fine erect hairing only, hair scarcely ever differentiated into any definite erect setae.

This group contains all the *Chrysorutilia* species except for those few forms from the Philippine Islands already discussed above; the *formosa*-group seems to be absent from the Philippines and replaced there by the *atrox* and *luzona* groups, in which there has been more extensive development of the bare or metallic areas of the head, reduction of the male claws, and the development of some definite setae among the hair of the last abdominal tergite (and also usually a doubling of the posterior notopleural seta together with some exceptional swelling of the hind part of the notopleuron itself). In the *formosa*-group there are always only the normal two notopleural setae (anterior and posterior), the parafrontals are thickly pollinose, and the genal dilations (though partly metallic) are dull and thinly pollinose at least anteriorly.

The concept of this group and of the subgenus *Chrysorutilia* as a whole rests nomenclaturally on the identity of *Rutilia formosa* Robineau-Desvoidy, of which the original material is lost. When Townsend (1915) erected the genus *Chrysorutilia*

he cited no characters for it, but based it upon the nominal species *R. formosa* R.-D., for which a neotype is herein designated. As Townsend (1915) cited no characters of *formosa* it is herein presumed that no conflict exists between *formosa* R.-D. as here fixed by neotype (which equals *formosa* in Malloch's and Enderlein's sense) and Townsend's *original* meaning of this name. For further discussion of this see under neotype designation for *R. formosa* on p. 124.

The limits of species in this group are often very uncertain. Some apparently distinct species which possess external pattern differences or differences of hair colour have male genitalia that differ but slightly or not at all. On the other hand, some very distinctive shapes occur in the male genitalia, especially in the shape of the surstyli, and where unusual surstylus shapes occur they appear to be constant and to define discrete species (for example, the bizarre shape of the surstylus in *R. cryptica* sp.n. is unmistakable and constant). In the past species have usually been founded on observed differences in external colour and pattern without regard to genital characters, and names have been bestowed on supposed 'species' in which the abdomen shows continuous transverse bands across the tergites and other names given to 'species' in which the tergite pattern is formed of completely or partially isolated spots. It has been found in the course of the present work that in many of the *Chrysorutilia* species there is little or no correlation between the male genital characters and the presence or absence of banded or spotted patterns. By removing the genitalia of a large number of male specimens of *R. (C.) splendida* (as this species was previously understood) it has been found that three species have been confused under this name which are easily recognized by constantly different shapes of the male surstyli: in the commonest one (for which the name *splendida* is fixed by neotype) the surstylus is simple in lateral and posterior view, having no trace of an anteromedian process (Text-fig. 72); in the second species (for which the name *decora* is fixed by neotype) the surstylus has a characteristic blunt swelling anteromedially which is just visible in posterior view (Text-fig. 73); and in the third species (which in the absence of an available name is here newly described as *cryptica*) the surstylus is produced anteromedially into an enormous forwardly directed tooth and is strongly excavate and acuminate between this tooth and its apex (Text-fig. 74) (the large tooth is very conspicuous in posterior view also). There is only a weak correlation in these three species between the genital form and the spot-pattern or band-pattern of the abdomen: in *splendida* the abdomen is usually banded but may have the bands broken into discrete spots, in *decora* the abdomen usually has discrete spots but may occasionally have continuous bands on one or both of the intermediate tergites, and in *cryptica* the pattern is similar to *decora* (most often spotted but banded specimens occurring).

Another example of more than one species confused under a single name is that of *R. (C.) imperialis*. When males of this 'species' were examined for the present work it was found that their genitalia had two distinct forms: in one the surstylus has a blunt anteromedian projection (similar to that of *decora*) and the cerci are rather slender in profile with the tips bent slightly forwards (Text-fig. 75); in the other the surstylus is much narrower and has no anteromedian projection, and the cerci in profile are broad medially with a rather sudden contraction before the rather straight

apical part (Text-fig. 76). These differences appear to be constant, and to define two semi-sibling species, which cannot be differentiated on their external characteristics. The original type-material of *imperialis* is lost and a neotype herein designated fixes the name to the species with the genital form shown in Text-fig. 75.

The existence of species which can only reliably be separated by male genitalia makes the determination of females rather hazardous, and it is not always possible to make completely dependable associations of males with females. As some of the primary types of described species are males and others females it is possible that more of the names are synonyms than are given in the list of included species which follows. Furthermore it is not yet clear whether pleural hair colour can be sexually dimorphic in any species, or whether hair colour can be variously black or yellow in the same sex in any species. At present black-haired and yellow-haired forms are assumed to appertain to different species, but this assumption may not be substantiated in future when better criteria can be found for determining what is a species than we have at present (at least it appears, so far, that a distinctive form of male genitalia is correlated with a particular hair colour).

#### INCLUDED SPECIES

- Rutilia (Chrysorutilia) caeruleata* (Enderlein) comb. n.** AUSTRALIA (Western Australia). [Lectotype examined.]  
*lineata* (Enderlein) **syn. n.** [Lectotype examined.]
- R. (C.) caesia* (Enderlein) comb. n.** AUSTRALIA (Northern Territory, Queensland, Western Australia). [Lectotype examined.]  
*rufibarbis* (Enderlein) **syn. n.** [Lectotype examined.]  
*viridescens* (Enderlein). [Holotype examined.]
- R. (C.) chersipho* (Walker) comb. n.** AUSTRALIA (Western Australia). [Neotype examined.]  
*erichsonii* Engel **syn. n.** [Lectotype examined.]
- R. (C.) corona* Curran.** AUSTRALIA (New South Wales). [Holotype examined.]
- R. (C.) cryptica* Crosskey sp. n.** AUSTRALIA (New South Wales, South Australia, Victoria). [Holotype examined.]
- R. (C.) decora* Guérin-Méneville.** AUSTRALIA (Tasmania to Queensland). [Neotype examined.]
- R. (C.) formosa* Robineau-Desvoidy.** AUSTRALIA (A.C.T., New South Wales, Victoria). [Neotype examined.]  
*pubicollis* Thomson **syn. n.** [Lectotype examined.]  
*subvittata* Malloch.  
*uzita* (Walker) **syn. n.** [Holotype examined.]
- R. (C.) goerlingiana* (Enderlein) comb. n.** AUSTRALIA (Western Australia). [Lectotype examined.]
- R. (C.) idesa* (Walker).** AUSTRALIA (? state). [Holotype examined.]
- R. (C.) imperialis* Guérin-Méneville.** AUSTRALIA (Tasmania to Queensland). [Neotype examined.]  
*ruficornis* Bigot **syn. n.** [Holotype examined.]  
*semifulva* Bigot **syn. n.** [Lectotype examined.]

- R. (C.) imperialoides** Crosskey sp. n. AUSTRALIA (Victoria to Queensland). [Holotype examined].
- R. (C.) nana** (Enderlein) comb. n. KAI [=KEI] ISLANDS. [Holotype examined.]
- R. (C.) panthea** (Walker). AUSTRALIA (South Australia, Western Australia). [Holotype examined].
- R. (C.) rubriceps** Macquart. AUSTRALIA (Queensland, ? Tasmania), CEYLON, INDIA, VIETNAM, BURU, ? TIMOR. [Holotype examined].
- angustigena* (Enderlein) syn. n. [Lectotype examined].
- serena* (Walker) syn. n. [Neotype examined].
- nitens* Macquart. [Holotype examined].
- formosina* Curran, 1930 syn. n. [Holotype examined].
- R. (C.) splendida** (Donovan). AUSTRALIA (Victoria to Queensland). [Neotype examined].
- australasia* Gray. [Type-material lost: synonymy established by Walker (1849 : 863) considered correct].
- confluens* (Enderlein). [Lectotype examined].
- evanescens* (Enderlein). [Holotype examined].
- R. (C.) transversa** Malloch. AUSTRALIA (Western Australia). [Holotype examined].

#### KEY TO SPECIES OF THE SUBGENUS *CHRYSORUTILIA*

[Note: The following key excludes the three species from the Philippines which are placed in separate species-groups and can be recognized from the group characteristics given elsewhere. The key attempts to place only the described species which are recognized in the present revisionary classification: specimens of undetermined, possibly new, species exist in museum collections and will not necessarily run out in the key (apart from a few species with distinctive male genitalia, such as *cryptica* sp. n., there is still much doubt about specific limits in this subgenus, and the supposed species tend to intergrade).]

- 1 Hair of pleural regions of thorax pale yellow to golden orange. Hair of suprasquamal ridge yellow. Hair of fore coxae partly or entirely yellow to golden red. Mesonotum of ♂ with much pale yellow to golden hair (except in *idesa*). Mesonotum without conspicuous white pollinosity, appearing metallic from almost any viewpoint . . . . . 2
- Hair of pleural regions black. Hair of suprasquamal ridge black (except in *rubriceps*). Hair of fore coxae entirely black or at most with a few yellow hairs near base. Mesonotum of ♂ with entirely black hair. Mesonotum with rather thick white pollinosity on anterior part of prescutum, usually over humeral calli and usually also on a supra-alar spot each side of scutum (pollinosity usually conspicuous to naked eye, but if not then conspicuous under microscope from some viewpoint as fly is turned) . . . . . 7
- Genal hair blackish brown. Mesonotal hair of ♂ blackish brown. ♂ genitalia with surstyli and cerci as in Text-fig. 77 . . . . . **R. idesa**  
 [This species is known only from Walker's ♂ holotype from an unknown Australian locality but appears to be distinct from any of the subsequently described nominal species.]
- Genal hair yellowish white to golden yellow. Mesonotal hair of ♂ mainly or entirely pale yellow to golden or golden orange. ♂ surstyli and cerci not so shaped . . . . . 3
- Species from Kei Islands. Mesopleuron with well developed white pollinose spot. Abdominal Tr + 2 with all black hair . . . . . **R. nana**

- Species from Australia. Mesopleuron without white pollinose spot and brilliant metallic, or at most with very thin pollinose overlay only visible at certain angles. Abdominal T1 + 2 with some pale yellow hair at least on mid-venter and often also on anteroventral part, sometimes on whole ventral surface . . . . . 4
- 4 Ground colour of parafrontals conspicuously darker than that of parafacials, from brown to blackish; inner margins of parafrontals (along the lines of frontal setae) usually with distinct traces of metallic green showing through the pollinosity (especially in ♀), and each side of vertex extensively metallic green or blue-green between eye and ocellar triangle. Wing base of ♂ strikingly explanate, the wings appearing to have prominent basal 'shoulders'. Third antennal segment mainly dark brown. Abdomen of ♂ appearing to naked eye semipellucid tawny reddish with silvery blue or blue-green reflections (i.e. not with clear cut bands on a dark ground). ♂ surstyli and cerci as in Text-fig. 81 . . . . . **R. formosa**
- Ground colour of parafrontals reddish yellow to reddish and therefore not noticeably contrasting with ground colour of parafacials; inner edges of parafrontals without trace of metallic colour, at most only slight trace of metallic greenish showing on vertex. Wing base of ♂ not explanate. Third antennal segment bright orange (except usually some reddish brown suffusion in *panthea*). ♂ abdomen usually not so coloured, with medially interrupted transverse green bands on dark ground colour. ♂ surstyli and cerci not exactly of this shape (though similar). . . . . 5
- 5 Vestiture of fore coxae and hypopleura entirely golden orange. Setulae of post-ocular row, the vertical setae, and some thoracic setae usually golden red. Abdominal T5 with some pale yellow hair laterally. Parafrontal hair usually largely pale yellow or whitish (sometimes all dark, especially in ♀). Third antennal segment unicolorous orange. Abdomen with the dark hind band of T3 slightly bowed forwards on each side, so that the transverse green band of the tergite is narrower near the middle on each side than elsewhere. More elongate species in which the abdomen is conspicuously longer than its width . . . . . 6
- Vestiture of fore coxae and hypopleura partly black (the strongest setae black). Setulae of postocular row, vertical and all thoracic setae black. Hair of abdominal T5 entirely black. Parafrontal hair all blackish. Third antennal segment partly suffused with reddish brown colour, especially on outer side. Abdomen with dark hind margin of T3 forming a transverse band of even width (no definite bowing forwards on each side), the metallic band of this tergite therefore also of even width across the abdomen. More robust species with abdomen not noticeably much longer than its width . . . . . **R. panthea**
- 6 Basicosta pale yellow. Setae of postalar callus and fringe of costal base golden red. Median abdominal dark line evanescent, virtually absent on T4. [Western Australia] . . . . . **R. goerlingiana**  

[This nominal species is perhaps not specifically distinct from *caesia*.]

- Basicosta blackish brown (if slightly pale then at least dark brown on anterior edge). Setae of postalar callus and fringe of costal base black (latter may have a very few red setulae intermixed). A fine purplish black median line distinct along all abdominal tergites. [Western Australia (including Monte Bello Is.) through Northern Territory to North Queensland] . . . . . **R. caesia**
- 7 Suprasquamal hair orange-yellow. Mesopleuron shining brilliantly, without white pollinose spot. Thorax without very thick white pollinosity over humeral calli and each side of scutum. ♂ surstyli as in Text-fig. 78. [Oriental Region to Queensland] . . . . . **R. rubriceps**
- Suprasquamal hair black. Mesopleuron with distinct white pollinose spot or extensively coated with white pollinosity conspicuous in some light (except in *corona*). Thorax with thick white pollinosity over humeral calli and usually on each side of scutum (if not evident to naked eye then distinct in some lights

- under microscope). ♂ surstyli and cerci usually differently shaped (but very similar in *chersipho* and *caeruleata*) . . . . . 8
- 8 Ground colour of parafrontals dark brown to blackish brown (head appearing dark to naked eye). Genal hair blackish brown. Third antennal segment dark brown to brownish black (at most only reddish orange at extreme base). Abdomen of ♂ usually showing some tawny brown colouring to naked eye visible through the metallic colouring . . . . . 9
- Ground colour of parafrontals yellow to reddish orange (head appearing distinctly yellow to naked eye). Genal hair yellow. Third antennal segment bright orange or yellow-orange (slightly suffused with darker reddish colouring in occasional specimen or brownish in *cryptica*). Abdomen of ♂ usually not showing very evident tawny colouring through the metallic colour . . . . . 10
- 9 ♂ genitalia with surstyli and cerci as in Text-fig. 75; surstylus with a blunt prominence submedially on the anterior edge and cerci in profile slender with the apical part bent slightly forwards . . . . . ***R. imperialis***
- ♂ genitalia with surstyli and cerci as in Text-fig. 76; surstylus rather slender and without submedian prominence on anterior edge, cerci in profile rather bulbous medially with the apical part more or less straight and narrowed abruptly from the bulbous middle part . . . . . ***R. imperialoides* sp. n. (p. 67)**
- 10 Mesonotum black or purple-black with a bold pattern of silver-blue markings as follows: pair of lines submedially on prescutum reaching to suture, spot over humeral callus, supra-alar spot on scutum, spot on hind part of notopleuron, small spot on outer edge of prescutum just mesad of notopleuron (all spots with white pollinosity and very shifting appearance). Scutellum not metallic, very dark reddish brown (almost blackish brown to naked eye); posteromedian part of scutum with dark red-brown colouring similar to scutellum when seen under microscope (but black to naked eye). Abdomen blackish brown with very strongly contrasting spots or bands of light metallic silvery blue or silvery green; the bands or spots widely separated medially and shape of those on T<sub>3</sub> and T<sub>4</sub> sublunate. [Western Australia; ♂ surstylus as in Text-fig. 84] . . . . . ***R. chersipho***
- Mesonotum without such pattern, ground colour not black but ranging from bright brassy green to deep blue-violet, usually with distinct darker vittae (dark specimens of *caeruleata* with deep blue-violet mesonotum may show pair of paler blue prescutal lines but if so then scutellum metallic violet also). Scutellum metallic, colour ranging from green to violet. Abdominal bands or spots deep golden green to violet-blue (rarely pale silvery in *caeruleata* but then scutellum violet); bands or spots of intermediate tergites usually not at all lunate . . . . . 11
- 11 Upper two-thirds or more of postorbits silvery white pollinose, sharply contrasting in colour with the golden yellow genae and postbuccae. [Eastern Australia] . . . . . 12
- All of the postorbits distinctly yellow pollinose, colour of postorbits therefore not strongly contrasting with the golden yellow genae and postbuccae. [Western Australia] . . . . . 15
- 12 Mesopleuron with distinct white pollinose spot which is very conspicuous to naked eye. Body length usually 14–18 mm (occasional ♂ specimens slightly smaller). Cerci and surstyli of ♂ of varied form . . . . . 13
- Mesopleuron without white spot, entirely shining. Length 13–14 mm. ♂ surstyli and cerci in profile similar to *rubriceps* (Text-fig. 78), surstyli in posterior view similar to *splendida* (Text-fig. 72) . . . . . ***R. corona***
- 13 ♂ genitalia with cerci and surstyli as in Text-fig. 74; surstylus of extraordinary form, with large forwardly directed tooth-like process and strongly acuminate between this process and the apex (the large tooth projecting laterally when hypopygium viewed from behind); apical part of cerci rather straight and slender or at most slightly sinuous, the tip not bending forwards or backwards. Lower calypter haired on most of its surface (occasional specimen with hairing only in

- basal depression of calypter). Calyptrae not or only extremely faintly infusate, basal part of upper calypter not unusually opaque white. Mesonotum with very broad bold continuous black sublateral vittae . . . . . *R. cryptica* sp. n. (p. 65)
- ♂ genitalia otherwise shaped, surstylus without such tooth-like process and cerci either with tips bent forwards or backwards (Text-figs 72 & 73). Lower calypter with surface hairing mainly confined to basal depression and area adjacent to suprasquamal ridge. Calyptrae distinctly infusate on at least the apical half, the basal half of the upper calypter unusually opaque white (the white colour very conspicuous to naked eye on side view of fly and strongly contrasting with the smoky lower calypter). Sublateral dark vittae of mesonotum either bold, broad and continuous or evanescent on scutum and broken at the suture . . . . . 14
- 14 ♂ genitalia with surstyli and cerci as in Text-fig. 73; surstylus with blunt antero-median projection and the cerci is profile very strongly recurved at their apices. Sublateral black vittae of mesonotum very broad, bold and continuous (no exceptions seen) . . . . . *R. decora*
- ♂ genitalia with surstyli and cerci as in Text-fig. 72; surstylus simple, without trace of prominence on its anterior edge, and cerci rather straight for most of their length but with the extreme tips bent distinctly forwards. Sublateral black vittae of mesonotum sometimes very broad, bold and continuous (especially in specimens from southern part of range) but usually fine and inconspicuous, evanescent on scutum and broken at transverse suture in Queensland specimens . . . . . *R. splendida*
- 15 Mesonotum dark bluish green to deep blue-violet, with the darker vittae very inconspicuous to naked eye (pair of lighter blue lines sometimes present on prescutum). Surstylus of ♂ genitalia in profile as in Text-fig. 79, not deeply concave on its anterior edge. White pollinosity of thoracic dorsum very inconspicuous to naked eye . . . . . *R. caeruleata*
- Mesonotum pale brassy green with the four black vittae very boldly marked. Surstylus of ♂ genitalia in profile rather deeply concave on anterior edge and strongly acuminate on apical half (Text-fig. 82). White pollinosity of thoracic dorsum conspicuous to naked eye on prescutum anteriorly between the vittae, on humeral callus and on supra-alar area of scutum . . . . . *R. transversa*

### *Rutilia (Chrysorutilia) cryptica* sp. n.

(Text-fig. 74)

♂. *Head*. Ground colour mainly yellow-orange to reddish orange on parafrontals and interfrontal area, genal dilations with some slight metallic golden green reflections in some lights; pollinosity mainly bright yellow, thinner on parafrontals than on parafacials, but pollinosity of postorbital silvery white over dark ground colour; upper occiput dark metallic green; parafrontals with a little dark brown colouring just below vertex. Parafrontal and most of parafacial hair black or brownish black; genal, postbuccal and lower parafacial hair yellow to golden orange; occipital hair yellowish white. Vertex 0.21-0.24 of head-width (0.22 in holotype). Frontal setae very fine, mostly hair-like, lowermost ones crossing at tips. Gena 0.48-0.61 of eye-height (0.56 in holotype). Parafacial very wide, about 4.0 times as wide as third antennal segment, completely haired. Antennae reddish orange on first two segments and base of third, remainder of third segment suffused with darker reddish brown to brown colouring; antennae falling short of epistome by about their own length; third segment about 2.1 times as long as second segment. Palpi yellow. *Thorax*. Dorsum golden green to violaceous blue with four very broad bold black vittae and blackish side-margins, the submedian pair of vittae stopping on scutum just beyond transverse suture, the sublateral black vittae continuous to hind margin of scutum and neither broken nor constricted at transverse suture; white pollinosity present over humeral calli, anteriorly on prescutum over the metallic areas between the pairs of black vittae, and on supra-alar spots, the pollinosity only conspicuous in

some lights. Sides of thorax purplish black or very dark brownish black with metallic areas coloured blue-green to purple-violet on upper sternopleuron and mesopleuron, the mesopleural metallic area largely covered by a bold white pollinose spot (conspicuous to naked eye); metallic areas of sternopleuron and mesopleuron often outlined with more violaceous colour than rest of metallic area. Thoracic hair (including suprasquamal ridge hair) entirely black. *Wings*. Basicosta black. Wing membrane clear hyaline (except for usual brown sub-basal area). First basal cell almost completely devoid of microtrichia. Calyptrae semi-translucent whitish, lower calypter at most only very faintly smoky, upper calypter not strikingly opaque white on basal part and therefore not very conspicuous to naked eye in side view; lower calypter with long dark erect hair on most of its surface (occasional specimen with hair confined to basal depression of lower calypter). *Legs*. Black with all black hair. Hind tibia with the *ad* fringe well developed and without *pd* setae. *Abdomen*. Ground colour blackish, purplish black or very dark tawny brownish with a pattern of golden green, light bluish green or slightly violaceous metallic areas arranged in spots or bands; black median vitta distinct to naked eye. T1 + 2 with a long transverse metallic area, slightly diffuse on each side; T3 with a pair of submedian and a pair of lateral metallic spots, the submedian and lateral spot of each side sometimes narrowly or broadly coalesced so that each side of T3 has a metallic band; T4 with a pair of submedian and a pair of lateral metallic spots which appear always to be well separated; T5 with a large metallic area on each side which is slightly excavate on its anterior margin so that the metallic area is slightly V-shaped or slightly lunate. All abdominal hair black, recumbent except on last tergite. Genitalia (Text-fig. 74): surstylus of very remarkable form, with a large sub-basal to submedian anteriorly and outwardly directed process and strongly excavate between this process and the apex, apical part as a whole strongly acuminate (the anterior process conspicuous in posterior view of hypopygium as well as in profile); cerci very slender on the apical third and this part very slightly sinuous, but actual apices of cerci not directed either forwards or backwards. *Measurements*. Body length about 11.5–15 mm, wing length about 12.5–15.5 mm.

♀. Generally similar to ♂ but ground colour of abdomen more distinctly black and metallic areas of abdomen tending to be more coppery green. White pollinosity of mesonotum more conspicuous than in ♂ and very conspicuous to naked eye between the black vittae of the prescutum and laterad of the sublateral vittae. No proclinate orbital setae. Vertex 0.27–0.29 of head-width. Hind tibia with either one or two small *pd* setae. Probably averaging larger than ♂ (three specimens seen with body length about 15 mm).

#### MATERIAL EXAMINED

Holotype ♂, AUSTRALIA: South Australia, near Moonta, 16.ix.1904 (*W. Wesche*). In British Museum (Natural History), London.

Paratypes. AUSTRALIA: 2 ♂, Victoria, Bright (*H. W. Davey*). 1 ♂, Victoria (*C. French*). 1 ♂, New South Wales, Barrington Top, 13–17.xii.1921 (*G. Goldfinch*). 2 ♂, 3 ♀, 'Australia' (no other data) (ex coll. Bigot). All paratypes in British Museum (Natural History).

DISTRIBUTION. Known only from south-eastern Australia.

AFFINITIES. *R. (C.) cryptica* sp. n. was in the past confused with *R. (C.) splendida* (Donovan) and *R. (C.) decora* to which it is certainly extremely closely allied. It has very similar or in some specimens identical metallic colour patterning to these species, but is distinguished from both of them (and from all other Rutiliini) by the quite exceptional shape of the surstyli (Text-fig. 74) mentioned in the description and the key; the surstylus shape is so characteristic that the species can be recognized immediately the male genitalia are examined. The shape of the apical part of the genital cerci also distinguishes *cryptica* from *decora* and *splendida* (in *cryptica* the

tips of the cerci are neither bent forwards nor backwards, whereas in *decora* they are recurved and in *splendida* bent forwards at the extreme tips). Other features are sufficiently well correlated with the genital differences to be of some value in distinguishing *cryptica* from *splendida* and *decora*; these include the non-infusate lower calypter (lower calypter extensively smoky brown in *splendida* and *decora*) and the unusually hairy lower calypter (in nearly all specimens of *cryptica* the lower calypter is haired on most of its surface, whereas in the other two species the lower calypter is hairy only in its basal depression). *R. cryptica* is of interest in this character because the extent and density of long dark erect hairing is much greater than in any other species of the subgenus *Chrysorutilia* (and therefore the lower calyptrae are much more hairy than in any other Rutiliine, as lower calyptral hairing is found only in the segregate *Chrysorutilia* and nowhere else in the tribe Rutiliini).

***Rutilia (Chrysorutilia) imperialoides* sp. n.**

(Text-fig. 76)

♂. *Head*. Ground colour of parafacials and genae mainly brownish orange, epistome more tawny yellow, parafrontals and outer margins of parafacials against the eyes blackish brown; genal dilations with golden green reflections in some lights (especially towards postbuccae); upper occiput dark metallic green; pollinosity mainly whitish over hind parts of genae and along parts of parafacials against the eyes, brownish yellow on upper anterior parts of genae and on parafacials (except against eye margins), greyish yellow on parafrontals; postorbital greyish white pollinose over dark ground; interfrontal area brick red. Hair of parafrontals, parafacials, genae and postbuccae black; occipital hair yellowish white. Vertex 0.15–0.17 of head-width. Frontal setae irregular, hair-like, apices of rows not meeting. Gena 0.36–0.40 of eye-height. Parafacial very wide, about 4.5 times as wide as third antennal segment, entirely haired. Antennae very small, falling short of epistomal margin by much more than their own length; basal segments dark reddish brown (more reddish orange on apex of segment 2), third segment brownish black except for narrow trace of orange colour at junction with second segment; third segment about twice as long as second segment. Palpi reddish orange. *Thorax*. Mesonotum dark metallic green with variable tinges of blue and violet, and with four broad bold black vittae; the submedian pair of vittae stopping on scutum just behind transverse suture, the sublateral pair appearing to naked eye to be completely continuous but actually narrowly broken at transverse suture (the prescutal part of the sublateral vitta stopping just short of transverse suture so that prescutum is very narrowly metallic green between end of the black line and the suture itself); humeral calli and anterior metallic parts of prescutum with distinct overlay of white pollinosity, supra-alar area only with an exceedingly thin trace of whitish pollinosity visible in some lights (i.e. no definite white pollinose supra-alar spots). Scutellum metallic dark green to violet). Sides of thorax black with metallic dark green to violaceous area on upper sternopleuron and on disc of mesopleuron; the mesopleural metallic area overlaid by white spot of thick pollinosity (most conspicuous from above). Thoracic hair (including that of suprasquamal ridge) entirely black. *Wings*. Basicosta black. Wing membrane clear hyaline (except for usual brown sub-basal mark). First basal cell with microtrichia along its length. Calyptrae yellowish white with some very faint trace of yellowish brown suffusion. Lower calypter almost completely bare, only a few erect dark hairs at extreme base of basal depression adjacent to suprasquamal ridge. *Legs*. Black with black hair. Hind tibia with *ad* fringe short, especially on apical third, and without *pd* setae or with one minute submedian *pd* setula. *Abdomen*. Dark reddish brown with a broad black conspicuous median vitta and with metallic areas on all tergites which range from cupreous to blue-green. Metallic areas arranged as follows: transverse strip on each side of  $Tr + 2$ ; band on each side of  $T_3$

which occupies the anterior two-thirds of tergite length; similar but narrower band on each side of T<sub>4</sub> occupying only about half tergite length; large metallic area on each side of the black median vitta on T<sub>5</sub> which occupies most of side of tergite and extends forwards to abut directly against hind margin of preceding T<sub>4</sub>. All abdominal hair black; dorsal hair recumbent on T<sub>1</sub> + 2 to T<sub>4</sub> (at most a little erect hair anteromedially on T<sub>3</sub> and hairing of hind margin of T<sub>4</sub> semi-erect as usual). Genitalia (Text-fig. 76): Surstylus in profile rather slender and simple (without trace of process on anterior edge), cerci in profile conspicuously bulbous medially and rather abruptly narrowing into the long, slender and rather straight apical part. *Measurements*. Large species, body length about 16–17 mm, wing length about 15–16 mm.

[♀. Not positively associated. Specimens in BMNH collection believed to be probably females of *imperialoides* have following features: Generally darker than ♂ with dark greenish colour of mesonotum less conspicuous because of stronger development of thick white pollinosity combined with very heavy black vittae; white pollinosity thick and conspicuous over humeral calli, supra-alar spots, three longitudinal lines on prescutum (between and on outer side of the submedian black vittae), over notopleuron and on a small spot on extreme outer edge of prescutum. Calyptres more infuscate than in ♂, opaque white base of upper calypter therefore more conspicuous. Abdomen very black with deep gold-green or cupreous metallic spots or areas as follows: transverse strip on each side of T<sub>1</sub> + 2; pair of submedian and pair of lateral spots on T<sub>3</sub>; pair of very small (much smaller than those on T<sub>3</sub>) submedian spots and pair of lateral spots on T<sub>4</sub>; very large subtriangular metallic area on each side of T<sub>5</sub> which does *not* reach forwards as far as the hind margin of T<sub>4</sub> (i.e. separated from latter by a narrow strip of black ground colour). Metallic spots on each side of T<sub>3</sub> sometimes partially or completely coalesced into a transverse band across each side of tergite. No proclinate orbital setae. Vertex 0.26 of head-width. Hind tibia with one or two small *pd* setae. Averaging larger than ♂, body length about 17–19 mm, wing length about 16–18 mm.]

#### MATERIAL EXAMINED

Holotype ♂, AUSTRALIA: New South Wales, Wee Jasper, xii.1920. In British Museum (Natural History), London.

Paratypes. AUSTRALIA: 1 ♂, same data as holotype. 1 ♂, Victoria (*F. du Boulay*). Both paratypes in British Museum (Natural History).

In addition to the ♂ holotype and paratypes cited above I have seen four female specimens in the BMNH collection which probably are conspecific. However, as positive association of these females with the males cannot be made at this time I exclude them from the type-series. Their data are: 1 ♀, Victoria, Monbulk, 1895; 1 ♀, Victoria (*C. French*); 1 ♀, New South Wales, Katoomba, Blue Mts, 3000–3300 ft, i.1912 (*Dodd junior*); and 1 ♀, Australian Capital Territory, Paddy's River, 2.ii.1955 (*Paramonov*).

DISTRIBUTION. South-eastern Australia including Victoria, New South Wales and Australian Capital Territory.

AFFINITIES. During the present revisionary work it was found that two quite distinct forms of genitalia were found amongst males of the supposedly single species previously identified by authors as *Rutelia imperialis* Guérin-Ménéville. In one form (Text-fig. 75) the surstylus has a blunt submedian prominence on the anterior edge and the cerci in profile are very slender and have the apical part bent slightly forwards; in the other form (Text-fig. 76) the surstylus is much narrower and completely lacks any trace of a prominence on the anterior edge, and the cerci in profile are very distinctly bulbous medially with a rather sudden contraction to the straight slender apical part. This difference can be recognized immediately the

male genitalia are examined (after removal from the fly), and there appear to be no intermediates. It has therefore been concluded that '*imperialis*' of authors consists of a confusion of two very closely allied species which are indistinguishable on external characters (or apparently so as none have been found of any value). As Guérin-Ménéville's type-material (which included a male specimen) is lost it was uncertain to which of the two species his name *imperialis* should be applied; this has therefore been resolved by neotype designation (see p. 125). The species with the prominence on the surstylus and the very slender cerci appears to be more common than the other species and the neotype specimen chosen for *imperialis* (which shows the genital characters clearly although the hypopygium remains in situ) is therefore of this species; there is no available name for the second species, which is therefore here described as new with the name *imperialoides*. The new species is clearly extremely closely allied to *imperialis* and examination of male genitalia is essential for accurate identification of *imperialoides* and *imperialis*.

### Subgenus *DONOVANIUS* Enderlein stat. n.

*Donovanius* Enderlein, 1936 : 409. Type-species: *Musca regalis* Guérin-Ménéville, 1831, by original designation.

*Psaronia* Enderlein, 1936 : 414. Type-species: *Psaronia bisetosa* Enderlein, 1936, by original designation. **Syn. n.**

*Menevillea* Enderlein, 1936 : 416. Type-species: *Rutilia pellucens* Macquart, 1846, by original designation [presumed correctly identified, but see discussion]. **Syn. n.**

**DIAGNOSIS.** Parafrontals pollinose, not metallic. Epistome and genae non-metallic. Facial carina flattened, slightly widened at level of base of third antennal segment, merging into lunula without a distinct depression. Parafrontals bare or partially haired (hairing if present normally not reaching as low as bottom of eye). ♀ normally without proclinate orbital setae (one or two present in some specimens). Arista micropubescent. Humeral callus with 3-4 setae, inner one or two sometimes scarcely differentiated from hair, very rarely only outer two present. Posthumeral setae absent or one inner posthumeral developed just mesad of humeral callus. Usually one *post ia* seta, occasionally none, rarely a small second seta developed. Scutum with or without some supernumerary prescutellar setae. Postalar callus with 4 (rarely 5) strong setae. Suprasquamal ridge thickly long haired. Scutellum flattened; with 4-10 pairs of marginal setae (these sometimes, stiff, straight, slightly spiniform); marginals not preceded by any preapical setae. Hair of lower part of pteropleuron not developed in front of level of posterior sternopleural seta. One sternopleural seta (o + 1), rarely trace of a small anterior *stpl* seta (especially in ♀). Prosternum bare; prosternal membrane with or without some long soft hair. Hind tibia with long regular anterodorsal fringe (without evident *ad* setae amongst it) and without *pd* setae or with only one such seta (very rarely trace of second *pd*). Abdomen with median depression in last tergite (T5). T3 without median marginal setae (rarely one pair in ♀), with lateral marginal setae. T5 with median transverse row of strong erect setae. Sternite 5 of ♂ with simple non-prominent rounded lobes. ♂ genitalia with distal membranous part of distiphallus subequal in length to or at most only slightly longer than sclerotized proximal part, and with extremely large foliaceous surstyli (Text-figs 66-71). [Mainly large forms measuring 15-23 mm, with dark head ground colour and usually dark unicolorous body, never with bold spot pattern.]

**DISTRIBUTION.** Mainly distributed throughout Australia and Tasmania, but a few species also in Solomon Islands, New Hebrides, Fiji and Samoa. Unknown from the Oriental Region and New Guinea.

DISCUSSION. This subgenus includes nearly one-third of the species of *Rutilia* s.l., and contains most of the large brown, blackish or purplish or dark green Australian species in which, even to the naked eye, the end of the abdomen appears excavate because of the median depression or groove in the last tergite. As early as 1775 Fabricius had described a species of this subgenus with a name (*R. retusa*) which apparently alludes to the blunt-ended appearance given to these flies by the apical excavation, and several common eastern Australian species belonging in *Donovanius* were described by the other early authors, such as *inusta* Wiedemann, *regalis* Guérin-Ménéville, *viridinigra* Macquart and *sabrata* Walker.

One of the species undoubtedly belonging in this subgenus is *R. pellucens* Macquart, for which a neotype is designated in this paper. This species was cited by Enderlein (1936) as the type-species of his genus *Menevillea*, but there are some slight discrepancies between the characters cited by Enderlein for *Menevillea* and those shown by the true *pellucens* as identified by Macquart and fixed by neotype (for example Enderlein mentions the presence of marginal setae on T<sub>3</sub> and 'Discalmacrochaeten', i.e. preapicals, on the scutellum). I have not seen the two female specimens determined and cited as *pellucens* by Enderlein (1936 : 416), but for the present am presuming Enderlein's identification to be correct, in which case it follows that *Menevillea* is a new synonym of *Donovanius* Enderlein. However, if it should prove (when Enderlein's specimens are located) that his *pellucens* was misidentified, then the name *Menevillea* would fall as a synonym of *Grapholostylum* or just possibly *Rutilia* s.str., but in any event it is certainly a synonym of an older name. (It is therefore of no practical importance whether Enderlein identified *pellucens* correctly or not.)

Enderlein's genus *Psaronia* was characterized mainly by having a single pair of median marginal setae on T<sub>3</sub> and by little else that notably distinguished it from *Donovanius*. It was based only on two female specimens (one herein designated lectotype). Examination of the lectotype of the type-species, *bisetosa*, shows that there are really no differences which justify holding *Psaronia* as a distinct taxon from *Donovanius* at supraspecific level and *Psaronia* is therefore placed as a synonym of the latter name.

Reference needs to be made here to Enderlein's genus *Psaroniella*, for which *Rutilia castanipes* Bigot was cited as type-species. In this case it is known positively that Enderlein misidentified the type-species, for I have seen the single female specimen (from Victoria, Koonwarra, Gippsland) that Enderlein cited as *castanipes* and found that it belongs to a completely different species from that described by Bigot. The true *castanipes* Bigot (type-material in BMNH examined) is a species of the subgenus *Donovanius* here defined, and the name is a junior synonym of *R. inusta* (Wiedemann); the specimen misidentified by Enderlein as *castanipes* actually belongs in the subgenus *Rutilia* s.str., and is a specimen of *R. setosa* Macquart. The generic name *Psaroniella* Enderlein is therefore a synonym of *Rutilia* s.str. and not of *Donovanius*.

The affinities of subgenus *Donovanius* seem clearly to lie most closely with *Chrysorutilia*. Both subgenera have four or more postalar setae, both have a very well developed fringe or comb of close-set setulae on the anterodorsal surface of the hind

tibia, both have extremely bushy and often crinkled hair on the suprasquamal ridge and there is normally only a single (posterior) sternopleural seta; other resemblances include the occurrence in most forms of hairing on the prosternal membrane, and general similarity in the shape of the facial carina (which tends to be rather flattened on the anterior face and to merge rather gradually into the lunula so that there is only a weak depression where carina and lunula coalesce). The broad sulcate last abdominal tergite with its transverse row of strong setae provides the most obvious external feature distinguishing *Donovanius* from *Chrysorutilia*, though the difference in the pteropleural hairing mentioned in the subgeneric key and shown in Text-figs 19 & 20 appears to apply constantly throughout the subgenera and to provide a real distinction. The large heavy foliaceous surstyli of the ♂ genitalia of *Donovanius* are very different from the narrow pointed surstyli found in *Chrysorutilia* (cf. Text-figs 66-71 & 72-84), and the ♂ genitalia therefore readily distinguish these two subgenera. Another minor difference between them, but one which is apparently constant, is the lack of any hairing actually on the prosternum in *Donovanius* which contrasts with the presence of at least a few fine hairs on the anterior corners of the prosternum in *Chrysorutilia*.

The species of *Rutilia* s.str. look superficially much like *Donovanius* on account of the grooved apex to the abdomen, but are at once separable by the presence of only three postalar setae and by the lack of a hind tibial fringe, and by the differently shaped ♂ surstyli (cf. Text-figs 54-57 & 66-71).

*Donovanius* species appear to be entirely unrepresented in the Oriental Region, but the distribution of the subgenus is more extensive in the Pacific islands than that of other subgenera, which are either confined to Australia (*Neorutilia*, *Ameniamima*, *Rutilia* s.str.) or else do not occur so far as is known anywhere further east than New Guinea and Australia (*Grapholostylum*) or the New Hebrides (*Chrysorutilia*). One species of *Donovanius* is known from Fiji (*transfuga* Bezzi) and two from Samoa (*savaiiensis* Malloch and *nigrihirta* Malloch), whence these are, respectively, the only Rutiliines known to occur. Samoa in Polynesia represents the easternmost limit of distribution of the tribe Rutiliini as a whole.

The British Museum (Natural History) collection contains a female specimen of the Samoan species *Rutilia* (*Donovanius*) *nigrihirta* Malloch which was reared from a larva of a Lucanid beetle identified as a species of *Aegus* Macleay, probably *A. upoluensis* Arrow; this seems to be the first fully authenticated host record for a species of subgenus *Donovanius*.

The species of *Donovanius* do not aggregate in any obvious way, and no species-groups are recognized within the subgenus. The ♂ genitalia with their very distinctive form of surstyli are extraordinarily uniform in all the species (or supposed species) of the subgenus.

Most of the synonymies shown in the list of included species that follows require no special comment, but amplification is needed here concerning *R. (D.) sabrata* (Walker) and *R. (D.) bisetosa* (Enderlein). One of the species of *Donovanius* is a large blackish brown form with dark violet reflections and unusually long antennae compared to those of other *Rutilia* species, and it was to this species that Malloch (1927 : 347; 1929 : 300) applied Guérin-Ménéville's name *inornata*, using (in the

later paper cited) the antennal length as a key character; as a result, Paramonov following Malloch has identified some specimens of the long-antenna species in different museum collections as *inornata* Guérin-Méneville. Neither Malloch nor Paramonov saw Guérin-Méneville's two original syntypes in Paris Museum, and Malloch's identification—working from the description alone—was reasonable; however, examination of the two *inornata* types during the present work (one of them bearing an original Guérin-Méneville label and herein designated lectotype, p. 72) has shown that the true *inornata* belongs in the subgenus *Rutilia* s.str. and is the same species as Guérin-Méneville's *desvoidyi* (= *vivipara* Fabricius). There are some discrepancies between the original description of *inornata* and the characters shown by the lectotype, especially as the legs are not as black as the description implies, but I see no reason to doubt that the two specimens in Paris are the two that Guérin-Méneville mentioned. Hence it is concluded that Malloch misidentified *inornata*. But the species that he called by this name showing the long antennae was described by Walker with the name *sabrata*, and this is the valid name for the species.

From comparison of Enderlein's types of *bisetosa* (described from the ♀ in *Psaronia*) and *nigribasis* (described from ♂ and ♀ as a variety of *Donovanius fulgidus* (Macquart)) I am convinced that the respective ♀ and ♂ lectotypes designated in this paper are conspecific and I therefore place *nigribasis* as a synonym of *bisetosa*. The name *bisetosa* is chosen to stand valid for the species in preference to *nigribasis* because it alludes to the character of a pair of median marginal setae on the third (apparent second) abdominal tergite which are present in both sexes, and because *bisetosa* is the name upon which Enderlein's so-called genus *Psaronia* was based. It should be added that the ♀ lectotype of *bisetosa* and the ♂ lectotype of *nigribasis* have the same type-locality, namely Marloo Station, Wurarga, Western Australia, which strongly supports the conclusion that both names apply to the same species.

#### INCLUDED SPECIES

- Rutilia* (*Donovanius*) *agalmiodes* (Enderlein) **comb. n.** AUSTRALIA (Queensland). [Holotype examined].
- R. (D.) analoga* Macquart. AUSTRALIA (Victoria to Queensland). [Holotype examined].
- dubitata* Malloch **syn. n.** [Holotype examined].
- R. (D.) bisetosa* (Enderlein) **comb. n.** AUSTRALIA (Western Australia). [Lectotype examined].
- nigribasis* (Enderlein) **syn. n.** [Lectotype examined].
- R. (D.) brunneipennis* Crosskey **sp. n.** SOLOMON ISLANDS (Guadalcanal). [Holotype examined].
- R. (D.) ethoda* (Walker). AUSTRALIA (Western Australia). [Holotype examined].
- R. (D.) inusta* (Wiedemann). AUSTRALIA (all states). [Lectotype examined].
- castanifrons* Bigot **syn. n.** [Holotype examined].
- castanipes* Bigot **syn. n.** [Lectotype examined].

- potina* (Walker) **syn. n.** [Holotype examined].  
*spinipectus* Thomson **syn. n.** [Lectotype examined].  
**R. (D.) lepida** Guérin-Méneville. AUSTRALIA (A.C.T., New South Wales, Victoria). [Neotype examined].  
*fulgida* Macquart **syn. n.** [Lectotype examined].  
*onoba* (Walker) **syn. n.** [Holotype examined].  
**R. (D.) nigrihirta** Malloch. SAMOA (Upolu). [Holotype examined].  
**R. (D.) pellucens** Macquart. AUSTRALIA (A.C.T., New South Wales, Victoria). [Neotype examined].  
*imitator* (Enderlein) **syn. n.** [Holotype examined].  
**R. (D.) regalis** Guérin-Méneville. AUSTRALIA (A.C.T., New South Wales, South Australia, Victoria). [Neotype examined].  
*nigra* Macquart (*nomen nudum*).  
**R. (D.) retusa** (Fabricius). AUSTRALIA (Western Australia). [Holotype examined].  
*aditha* (Walker) **syn. n.** [Holotype examined].  
*viriditestacea* Macquart **syn. n.** [Lectotype examined].  
**R. (D.) sabrata** (Walker). AUSTRALIA (New South Wales, Queensland). [Holotype examined].  
*inornata* Guérin-Méneville *sensu* authors. Misidentification.]  
**R. (D.) savaiiensis** Malloch. SAMOA (Savaii). [Holotype examined].  
**R. (D.) spinolae** Rondani. AUSTRALIA. [Type-material not located, possibly lost; species unrecognized, tentatively assigned to *Donovanius*].  
**R. (D.) transfuga** Bezzi. FIJI (Viwa, Viti Levu). NEW HEBRIDES (Eromanga, Espiritu Santo, Malekula, Tana). [Holotype examined].  
**R. (D.) viridinigra** Macquart. AUSTRALIA (New South Wales, Queensland). [Lectotype examined].  
*barcha* (Walker) **syn. n.** [Holotype examined].  
*fuscotestacea* Macquart **syn. n.** [Holotype examined].

# KEY TO SPECIES OF THE SUBGENUS *DONOVANIUS*

[*Note:* The limits of species in this subgenus are very difficult to determine. There are few structural characters that appear to have much value in separating species, and the ♂ genitalia are so uniform (or at least differ in such a subtle and intangible way) that they have little value for species recognition. It is often difficult reliably to associate males and females, and there is clearly much variation within a species in such features as hairiness of parafacials, development of median marginal setae on T<sub>3</sub>, and the number of proclinate orbital setae in females. At present the entities considered to be species differ mainly in their general appearance as shown by body colour, hair colour and size; these features seem to separate specimens into fairly convincing species, but there is considerable intergradation (new synonymies established above are based on absolute agreement between types). The key here given must be treated as very tentative: it is by no means certain that the named taxa represent distinct species, and museum collections may contain undetermined specimens that will not conform with the key. *R. spinolae* is omitted as the type has not been located and the name remains enigmatic.]

1	Australian species . . . . .	2
—	Melanesian and Samoan species . . . . .	12

- 2 Pleural regions of thorax with pale yellow or golden hair (in *bisetosa* mesopleural hair mainly dark and some dark hairs on sternopleuron). Hair of suprasquamal ridge yellow . . . . . 3
- Pleural regions of thorax with black hair (occasionally some inconspicuous pale yellow hair on fore margin of mesopleuron, on barett and posteroventral part of pteropleuron). Hair of suprasquamal ridge black or brownish black (some specimens of *sabrata* with some yellow hair intermixed with dark hair) . . . . . 6
- 3 Wing base explanate, wings appearing to have strongly developed basal 'shoulders'. Colouring distinctive, prescutum and scutum dark green, scutellum violet, abdomen light tawny yellow with sharp black median line. Abdomen with entire venter of T<sub>1</sub> + 2 and mid-venter of T<sub>3</sub> pale yellow haired. Surstyli of ♂ genitalia longer and narrower than usual (Text-fig. 65)
- R. agalmiodes*** (♂ only, ♀ unknown)
- Wing base not noticeably explanate. Not so coloured, if abdomen rather light tawny then mesonotum only very dull greenish and scutellum not violet. Abdomen almost entirely black haired (except in *analoga*). ♂ surstyli of usual large wide form (e.g. as in Text-fig. 67) . . . . . 4
- 4 Hair of abdominal T<sub>5</sub> pale yellow or golden. Parafrontal hair of ♂ mainly yellowish white (black in ♀). Mesonotum dull dark greenish or greenish brown or sometimes blackish brown in ♀, with conspicuous whitish pollinosity, slightly contrasting with the tawny (♂) or red-brown (♀) abdomen; abdomen with distinct dark centre line. Parafacials bare or partially haired . . . . . ***R. analoga***
- Hair of abdominal T<sub>5</sub> black. Parafrontal hair black in both sexes. Colour varied but not as above, whitish pollinosity of mesonotum very inconspicuous. Parafacials more or less completely haired . . . . . 5
- 5 Pleural hair entirely yellow. First basal cell of wing without microtrichia.<sup>2</sup> Abdominal T<sub>3</sub> without median marginal setae. Colouring generally dark, slightly metallic, greenish blue or violaceous . . . . . ***R. retusa***
- Pleural hair mainly blackish on mesopleuron and sometimes on upper edge of sternopleuron. First basal cell with microtrichia.<sup>2</sup> Abdominal T<sub>3</sub> usually with a pair of median marginal setae. Colour varying from dark bronze-green to coppery brown or blackish brown, sometimes with purplish red tinge on abdomen
- R. bisetosa***
- 6 Predominantly green species, colour ranging from light golden green to dark green or blue-green. Abdomen with fine dark median line and dark tergite hind margins well visible to naked eye . . . . . 7
- Colour not green but ranging from red-brown to blackish brown or violaceous black, sometimes with bronze or coppery purple tinges (rarely slight trace of very dark green colour visible but then over an almost black general colour). Dark median abdominal line and dark tergite hind margins inconspicuous to naked eye (except in ♂ of *pellucens*) . . . . . 8
- 7 Abdomen of ♂ with ground colour of intermediate tergites (T<sub>3</sub> and T<sub>4</sub>) pale tawny reddish, the tawny colour clearly visible to the naked eye through the metallic green or bluish tints (especially as fly is turned); these two tergites also with rather thick white overlay of pollinosity which makes them appear distinctly white when viewed from behind. ♂ usually 15–17 mm in body length . . . . . ***R. lepida***  
[♀ not definitely associated: golden green to blue-green females resembling those of *regalis* but with elongate third antennal segment (c. 4–5 times as long as second segment) appear to be *lepida*]
- Abdomen of ♂ without such appearance, ground colour all dark and intermediate tergites with only very thin inconspicuous whitish pollinosity basally, abdomen therefore appearing a pure golden green to blue-green (occasional specimen coppery green). ♂ usually 17–19 mm in body length . . . . . ***R. regalis***  
[Females of golden green to blue-green colour with antennae of normal length

(third antennal segment about 3 times as long as second segment) are almost certainly *regalis*]

- 8 First basal cell without microtrichia.<sup>2</sup> Blackish species with a purple or violaceous tinge in most specimens, occasionally a dark greenish black tinge (some dark brownish black specimens without metallic tinge occur and resemble *inusta*: careful check on presence or absence of microtrichia along first basal cell essential on such specimens) . . . . . 9
- First basal cell with microtrichia along its whole length (at least medially). Red-brown to very dark blackish brown species, normally without purplish tinge (some coppery purple tinge in *ethoda*) . . . . . 10
- 9 Antennae unusually long, falling short of epistomal margin by about as much as their own length in ♂ and by conspicuously less than their own length in ♀; third segment about 3.5 times as long as second segment in ♂ and 4-5 times as long as second segment in ♀ (facial carina correspondingly elongate, especially in ♀). Thorax with some very pale yellow hair on anterior edge of mesopleuron, on ventral edge of humeral callus, around prostigmatic area, on barett and postero-ventrally on pteropleuron (sometimes also some pale hairs on suprasquamal ridge). Apical pair of scutellar setae conspicuously smaller than other scutellar marginal setae . . . . . ***R. sabrata***
- Antennae of normal small size, usually falling short of epistomal margin by more than their own length in both sexes; third segment about 2-2.5 times as long as second segment in both sexes (facial carina not unusually elongate). Thorax without any pale hair. Apical scutellar setae usually not conspicuously smaller than other scutellar marginal setae . . . . . ***R. viridinigra***
- 10 Thorax and abdomen with burnished coppery bronze or purplish reflections, sometimes also traces of green colouring. [Western Australia] . . . . . ***R. ethoda***
- Body without such burnished reflections (at most only the scutellum faintly violet). [Eastern Australia from Tasmania to Queensland] . . . . . 11
- 11 Abdomen of ♂ light reddish brown or tawny brown with conspicuous black median line, abdomen of ♀ blackish brown or almost black with the median line scarcely detectable to naked eye. Smaller species, length usually 13-16 mm . . . . . ***R. pellucens***
- Abdomen of both sexes very dark, brownish black to black, sometimes very dark reddish brown on T<sub>3</sub> in the ♂ (but ♂ abdomen consistently darker than the more tawny abdomen of ♂ *pellucens*). Larger species, length usually 16-20 mm . . . . . ***R. inusta***  
[Note that the females of *inusta* and *pellucens* are not reliably distinguishable on present evidence]
- 12 Body unicolorous dark purplish brown. Epistome blackish. All hair black. Wings heavily infuscate, especially on anterior half. Calyptrae blackish brown. Very large species, length about 20 mm. [Solomon Islands] . . . . .  
. . . . . ***R. brunneipennis* sp. n. (p. 76)**
- Body either unicolorous green or with green to blackish mesonotum and mainly tawny or reddish brown abdomen. Ground colour of epistome reddish yellow. Hair black or yellow hair present on pleural regions. Wings not infuscate or (in *nigrihirta*) with yellowish brown staining along veins. Small to medium sized species, length 10-16 mm. [New Hebrides, Fiji or Samoa] . . . . . 13
- 13 Hair entirely black. Legs black. Colour uniformly dark green on thorax and abdomen. [Samoa] . . . . . ***R. nigrihirta***
- Hair of pleural regions of thorax and most of the fore coxal hair pale yellow to golden orange. Legs partly reddish yellow. Abdomen mainly tawny yellow to

<sup>2</sup> The microtrichia of the first basal cell are very small, and care is needed to determine whether the cell is bare (i.e. without microtrichia beyond the brown-pigmented base) or whether it has a band of microtrichia along its length (even when present the microtrichia are sometimes confined to an area along the middle of the cell). The cell needs to be examined by transmitted light at a magnification not less than  $\times 100$ .

- reddish brown and contrasting with green or blackish mesonotum (some specimens with golden green abdomen rather similar to mesonotum but then pale ground showing through the green colour). . . . . 14
- 14 Unusually small species, length 10–11.5 mm. Bristling of venter of sternopleura, mid and hind coxae and prescutellar region not noticeably spiniform. Femora entirely reddish yellow. [Samoa] . . . . . *R. savaiiensis*
- Larger species, length 12.5–16 mm. Bristling of venter of sternopleura, mid and hind coxae, prescutellar region and scutellum very strong, stiff, rather straight and sub-spiniform. Femora either reddish yellow or partly or mostly darkened to reddish brown or dark brown. [Fiji and New Hebrides] . . . . . *R. transfuga*

***Rutilia (Donovanius) brunneipennis* sp. n.**

♀. *Head*. Ground colour brownish black on most of head, genal regions dark reddish brown, epistome black. Head pollinosity very thin and whitish, bases of parafrontal hairs appearing as slightly darkened minute dots. Parafrontal and parafacial hair black, genal hair blackish brown, occipital hair yellowish white. Vertex 0.25 of head-width. Frontal setae very fine, meeting or crossing at tips. Proclinate orbital setae absent. Gena very wide, 0.50 of eye-height. Parafacial about three times as wide as third antennal segment, with short sparse black hairs on most of its height. Antennae black and slightly elongate (facial carina correspondingly slightly longer than usual), third segment about 2.5 times as long as the rather long second segment; antennae falling short of epistomal margin by about 1.3 times their length. Palpi brownish with tawny apices. *Thorax*. Dark purplish brown with no evident metallic colour to naked eye (mesonotum with slight coppery purple glints under microscope); mesonotum without obvious pollinosity and without definite dark vittae (thin trace of whitish pollinosity present on prescutum and visible under microscope when seen from behind). All thoracic hair black. Scutellum with eight pairs of marginal setae (apicals included), the apical pair very much smaller than other marginals; scutellar marginals (and also the prescutellar setae) rather stiff and straight.  $o + 1$  *stpl* setae. *Wings*. Basicosta black. Wing membrane distinctly infusate, especially anterobasally, suffused with dark brown along the veins and especially on *r-m* cross-vein. First basal cell completely microtrichiate, as the rest of the wing. Calyptrae blackish brown with brown fringe hair. *Legs*. Black with entirely black hair. Hind tibia with well formed even close-set *ad* fringe. *Abdomen*. Dark purplish brown with entirely black hair, concolorous with thorax. T<sub>3</sub> without median marginal setae. Hair of T<sub>3</sub> recumbent, of T<sub>4</sub> semi-erect, and of T<sub>5</sub> erect. *Measurements*. Large species, body length about 20 mm, wing length about 19 mm.

♂. Unknown.

**MATERIAL EXAMINED**

Holotype ♀, SOLOMON ISLANDS: Guadalcanal, Suta, 27.vi.1956 (*E. S. Brown*). In British Museum (Natural History), London.

**DISTRIBUTION.** Known only from the holotype from Guadalcanal in southern Solomon Islands.

**AFFINITIES.** *R. brunneipennis* sp.n. unquestionably belongs in the subgenus *Donovanius*, although it should be noted that the holotype is aberrant in one respect: the postalar callus of the left side has the normal 4 strong setae, whereas that of the right side has only three postalar setae. It is the only species of the subgenus yet known from the Solomon Islands. The heavy infuscation of the wings (to which the specific name alludes) makes the species appear quite distinctive, though in the general very dark and uniform colouring it is rather similar to *R. (D.) inusta*, to which it is perhaps closely allied. The ♂ is unknown, but as the ♂ genitalia in

*Donovanius* are of very little or no use for identification it is considered justified to describe this new species from a female holotype.

### Subgenus *RUTILIA* Robineau-Desvoidy

*Rutilia* Robineau-Desvoidy, 1830 : 319. Type-species: *Tachina vivipara* Fabricius, 1805, by subsequent designation of Crosskey (1967 : 26).

*Psaroniella* Enderlein, 1936 : 417. Type-species: *Rutilia castanipes* Bigot sensu Enderlein [misidentification] [= *Rutilia setosa* Macquart, 1847], by original designation. **Syn. n.**

*Stiraulax* Enderlein, 1936 : 428. Type-species: *Tachina vivipara* Fabricius, 1805, by original designation. [Isogenotypic name with *Rutilia* Robineau-Desvoidy, junior objective synonymy first noted by Crosskey (1967 : 26)].

**DIAGNOSIS.** Parafrontals pollinose, not metallic. Epistome and genae non-metallic. Facial carina with anterior surface of upper part convex or with slight median ridge and only lower part flattened on anterior surface, sides slightly pinched-in ventrally, separated from lunula by distinct depression well visible in profile. Parafacials bare or haired. ♀ with proclinate orbital setae (normally one pair well developed, rarely two each side, very rarely absent). Arista micropubescent. Humeral callus with 3-4 setae. Posthumeral setae distinct in both sexes, variably from 1-3 each side. One or two *post ia* setae. Scutum without supernumerary prescutellar setae (rarely the last *post acr* seta doubled). Postalar callus with three strong setae. Suprasquamal ridge haired or bare. Scutellum with slight dorsal flattening or hollowing just before tip; with 5-7 pairs of marginal setae (these rather stiff and straight); with a well developed transverse row of small preapical setae preceding the marginals. Pteropleuron not haired in front of level of posterior sternopleural seta. Two or three sternopleural setae (1 + 1 or 2 + 1). Prosternum and prosternal membrane bare. Hind tibia without definite anterodorsal fringe or with short inconspicuous fringe, normally from 1-3 *ad* setae well developed, 2-4 well developed *pd* setae or occasionally one *pd* only in ♂. Last abdominal tergite (T5) with median depression (rather small and shallow in *confusa*). T3 with transverse row of several (usually 6-12, but often only 2-4 in *confusa*) strong erect often spiniform median marginal setae, the row slightly arcuate forwards so that middle setae of the transverse row are more distant from hind margin of the tergite than the others; T3 also with lateral marginal setae. T5 with median transverse row of strong erect setae. Surstyli of ♂ genitalia of rather varied form (Text-figs 54-57). [Dull reddish brown, tawny or blackish brown forms, with little or no metallic colouring, at most with very slight reddish violet or greenish tinge dorsally on thorax and intermediate abdominal tergites].

**DISTRIBUTION.** Occurring only in Australia from Tasmania to Queensland.

**DISCUSSION.** Before considering the characteristics and interrelationships of *Rutilia* in the strict sense it is necessary briefly to discuss the type-species of the genus and its fixation, for there has been some confusion in past taxonomic bibliography; although, fortunately, this has not affected the generic concept of *Rutilia*. The genus when originally described by Robineau-Desvoidy contained four nominal species, one of which was *Rutilia vivipara* (Fabricius), which Fabricius (1805) had described in the genus *Tachina* Meigen. Robineau-Desvoidy's (1830) identification of *vivipara* related to a specimen that stood in the collection of Count Dejean, and may or may not have been correct, but there has never been any means of confirming the rightness of Robineau-Desvoidy's identification because both the specimen from Dejean's collection and Fabricius' type of *vivipara* are lost. But there are a few discrepancies between the brief descriptions of Fabricius and Robineau-Desvoidy (the latter for instance mentioning a bluish tinge on the mesonotum) and on the basis

of these Guérin-Méneville (1843 : 264) concluded that Robineau-Desvoidy was dealing with a different species from Fabricius (though as he had not, it seems certain, seen the specimens of either author his conclusion was based on little more than guesswork). Following upon his conclusion, Guérin-Méneville (*op. cit.* : 264, 269) described the species supposedly misidentified by Robineau-Desvoidy as *Rutilia desvoidyi* Guérin-Méneville, and subsequent references to the Rutiliini contain various citations of the type-species of *Rutilia* as *vivipara* or as *desvoidyi*. I have earlier (Crosskey, 1967 : 26) shown that none of these citations were valid for type-fixation, either because the fixation was made ambiguously, or the name cited was not that of a nominal species or was that of a species not originally included in *Rutilia*, and I therefore published a designation of *Tachina vivipara* Fabricius as type-species of *Rutilia*. In the present revisionary work it is now most desirable to establish beyond any future doubt the identity of *vivipara* Fabricius, as this species is the nomenclatorial pivot of the whole Rutiliini, and to show that *desvoidyi* Guérin-Méneville is in reality a junior synonym of *vivipara* Fabricius.

The original description of *vivipara* might not be readily accessible to Australian dipterists likely to work on the Rutiliini, and I therefore quote it here: *Tachina vivipara*

'T. pilosa grisea, abdomine ferrugineo, scutello cupreo.

Habitat in Insulis maris pacifici carnes consumens vivipara. Dom. Billardiére.

Magna. Caput griseum, ore albido. Thorax pilosus, griseus, fusco lineatus.

Scutellum cupreum, nitidum. Abdomen pilis atris, rigidis hirtum, subferrugineum, segmentorum marginibus nigris. Pedes pallide testacei.'

All later workers have assumed, and I agree with this assumption, that the provenance of Fabricius' specimen was almost certainly Australia, though recorded as 'Insulis maris pacifici'; localities of origin were often very imprecisely recorded at the time when Fabricius was writing, and although some *Rutilia* are now known from the Pacific islands it cannot be said that Fabricius' description fits any of them at all well. On the other hand, for such an early work, it is an extremely good description of a common *Rutilia* species which occurs throughout eastern Australia from Cape York to Tasmania and which has been commonly identified as *vivipara* for many years. This species has entirely reddish yellow legs, a ferruginous colour often with rather coppery scutellum, conspicuous blackish brown thoracic vittae, blackish hind margins to the abdominal segments, and exceptionally strong rather spiniform abdominal bristling, and is therefore a virtually perfect match with Fabricius' statements (respectively 'pedes pallide testacei', 'abdomine ferrugineo', 'scutellum cupreum, nitidum', 'thorax . . . fusco lineatus', 'abdomen . . . segmentorum marginibus nigris', and 'rigidis hirtum'). There is only one large (Fabricius' 'magna') species of *Rutilia* with all pale legs, strongly vittate thorax, dark reddish brown colouring, and such strongly bristled abdomen, and it is to this species that Fabricius' name *vivipara* unquestionably applies and it is from this species that a neotype for *vivipara* has been designated elsewhere in this paper (see p. 126).

With the identity of *vivipara* Fabricius objectively pinned down by neotype it is now possible to determine whether *desvoidyi* Guérin-Méneville is distinct from *vivipara* or not. One of three original syntypes of *desvoidyi* still exists in the Paris

Museum and is herein designated as lectotype (see p. 119); the lectotype is in rather poor condition (some mould, holes in body, a mid and a fore leg missing) but it shows the bare parafacials, three postalar setae, haired suprasquamal ridge, entirely reddish yellow legs, brown abdomen with darkened hind margins to the segments, yellowish pleural hair, and same form of chaetotaxy, and is considered undoubtedly conspecific with the neotype of *vivipara*. Hence *desvoidyi* Guérin-Ménéville is here placed as a new synonym of *vivipara* Fabricius, and it is concluded that *vivipara* of Robineau-Desvoidy (1830) (= *desvoidyi* according to Guérin-Ménéville) is actually therefore the same species as *vivipara* Fabricius and not a misidentification as Guérin-Ménéville supposed. Consequently there is no longer any confusion over the type-species of *Rutilia*: *Tachina vivipara* Fabricius is an originally included nominal species, correctly identified by Robineau-Desvoidy, and fixed as type-species of the genus by subsequent designation of Crosskey (1967 : 26).

*Tachina vivipara* Fabricius is also type-species by original designation of *Stiraulax* Enderlein, and this name thus falls as a junior objective synonym of *Rutilia* Robineau-Desvoidy. One other name enters into junior synonymy with *Rutilia* s.str., namely *Psaroniella* Enderlein, the type-species of which was cited by Enderlein (1936 : 417) as *castanipes* Bigot; but Enderlein misidentified *Rutilia castanipes* Bigot (which belongs in subgenus *Donovanius*, the name a synonym of *inusta* Wiedemann) and the single specimen from Gippsland, Victoria, that he cited belongs to *Rutilia* (*Rutilia*) *setosa* Macquart, and the generic name *Psaroniella* is therefore a synonym of *Rutilia* s.str. and not of *Donovanius*. (The ♀ specimen identified as *castanipes* by Enderlein is in MNHU collection, Berlin, and has been examined: it is labelled 'Koonwarra Gippsland, Victoria' and has a determination label in Enderlein's hand reading 'Psaroniella castanipes (Big. 1880) ♀ Dr Enderlein det. 1936'.)

*Rutilia* s.str. contains only a small number of species, and although the typical group of the genus in a nomenclatorial sense is not very representative of the wide range of forms included in the genus as a whole. The rather strongly developed ventral marginal bristling of the abdominal tergites, especially in *vivipara* itself, sets the subgenus rather apart from all the other *Rutilia*, and the possession of only three strong setae on the postalar callus makes the included forms rather obviously different from superficially similar large brown forms with depressed tip to the abdomen found in the subgenus *Donovanius*. In *vivipara* the abdominal chaetotaxy is more strongly spiniform than in all other *Rutilia* s.l. and the marginal setae of the ventral ends of the tergites are so strong and stiff that they simulate the similar very strong setae found in *Formosia*; but whereas in *Formosia* the bristles of the tergite venters are directed almost straight downwards those of *R. vivipara* are directed backwards or mainly so (and those of the female are shorter and more stubby than those of the male). The third abdominal tergite in *Rutilia* s.str. has unusually well developed median marginal setae, which often enable specimens of the subgenus to be distinguished at once from other subgenera. Normally the T<sub>3</sub> median marginals form a transverse row of about six to a dozen erect setae, the row bowing forwards near the centre so that the middle one or two pairs of marginal bristles are not close to the hind edge of the tergite like the rest (and are therefore less truly *marginal*);

in other subgenera median marginal setae are normally absent on T<sub>3</sub> or represented by only a single fine pair.

*Rutilia* s.str. is most easily distinguished from *Chrysorutilia*, *Donovanius* and *Ameniamima*, by the possession of only three instead of four or more setae on the postalar callus, and from *Chrysorutilia* and *Ameniamima* by the absence of pteropleural hairing in front of the posterior sternopleural seta. It differs also from *Chrysorutilia* and *Donovanius* by lacking a long hind tibial fringe (though a short one is present in *confusa*), and usually by having two distinct *pd* setae on the hind tibia. The depression in the last abdominal tergite, and the presence of two or three strong sternopleural setae, also, separate *Rutilia* s.str. from *Chrysorutilia*.

In species of *Rutilia* s.str. the suprasquamal ridge may be bare or haired (though presence or absence of such hairing seems to be constant within each species). In *vivipara* the ridge is haired, but the hairing is rather short and sparse (as in the species of *Grapholostylum*) instead of very long, dense and crinkly (as in the species of *Donovanius*, *Chrysorutilia*, and *Neorutilia*), a fact which perhaps suggests that the affinities of *Rutilia* s.str. lie more closely with *Grapholostylum* than with any other subgenus, a supposition which is supported by the several other character that *Rutilia* and *Grapholostylum* share in common (among them the three postalars, lack of hind tibial fringe, unusually strong development of the chaetotaxy of the thoracic dorsum, pteropleuron bare in front of the posterior *stpl* seta, and rather similar form of facial carina).

If all the species of *Rutilia* s.str. and *Grapholostylum* are considered it is found that there are one or two species which are rather intermediate and tend to form an interconnecting link between the two subgenera, as discussed in more detail under *Grapholostylum*. One of these, here placed in *Rutilia* s.str., is the aptly named species *confusa* Malloch. This species has the suprasquamal ridge bare and on this account was originally described by Malloch as a *Formosia*, but it has none of the characters of true *Formosia* apart from the bare ridge and is certainly a *Rutilia* in all other respects (just as the species of *Ameniamina* subgen.n. with bare suprasquamal ridge are equally *Rutilia* in the wide sense); but *confusa* has only some 2-4 (rarely more) median marginal setae on abdominal T<sub>3</sub>, has a somewhat shallow median depression in T<sub>5</sub>, and has a definite though short hind tibial fringe, and so differs in these features from *vivipara*; on the other hand, it has rather strong ventral marginal setae on the tergites, colouring very like that of *vivipara*, and the form of 5th abdominal sternite of the male, which all confirm the correct placement of *confusa* in *Rutilia* s.str.

The following points should be noted about the synonymies indicated in the list of included species. The neotype specimen herein designated for *Rutilia durvillei* Robineau-Desvoidy (see p. 124) is conspecific with the neotype of *vivipara*, and *durvillei* therefore goes into synonymy; apart from being justified by what little is known of *durvillei* from the original description it is desirable to dispose of this name as a synonym since it has never been in use for a recognized species. Enderlein (1936 : 430) suggested that *durvillei* was perhaps only a variety of *desvoidyi* (= *vivipara*); the present fixation of the neotype eliminates the name completely as a junior synonym. For *Rutilia inornata* Guérin-Ménéville an original syntype specimen

still exists in Paris Museum and is here designated as lectotype (see p. 119); it has three postalar setae, haired suprasquamal ridge, and all the other features shown by *vivipara* and is believed to be undoubtedly conspecific with the neotype of *vivipara*; hence *inornata* also is placed as a synonym of *vivipara*. (But note that the name *inornata* has been misapplied in the literature to the species that should be called *sabrata* Walker and belongs in *Donovanius*: see further discussion of this under that subgenus.)

# INCLUDED SPECIES

*Rutilia (Rutilia) confusa* (Malloch). AUSTRALIA (A.C.T., New South Wales, South Australia, Victoria). [Holotype examined].

*R. (R.) dentata* Crosskey **sp. n.** AUSTRALIA (Victoria). [Holotype examined].

*R. (R.) setosa* Macquart. AUSTRALIA (New South Wales, Victoria). [Neotype examined].

[*castanipes* Bigot sensu Enderlein, 1936. Misidentification.]

*R. (R.) vivipara* (Fabricius). AUSTRALIA (A.C.T., New South Wales, Queensland, Tasmania, Victoria). [Neotype examined].

*desvoidyi* Guérin-Méneville **syn. n.** [Lectotype examined].

*durvillei* Robineau-Desvoidy **syn. n.** [Neotype examined].

*inornata* Guérin-Méneville **syn. n.** [Lectotype examined].

## KEY TO THE SPECIES OF SUBGENUS RUTILIA

- 1 Suprasquamal ridge haired . . . . . *R. vivipara*
- Suprasquamal ridge bare . . . . . 2
- 2 Legs entirely reddish yellow. Scutum, especially in ♂, with a dark green tinge to naked eye and with rather inconspicuous presutural vittae. Surstylus of ♂ genitalia shaped as in Text-fig. 55 . . . . . *R. confusa*
- Legs partially dark brown to blackish brown. Scutum not appearing dark green to naked eye, sometimes with coppery violet tinge. Surstylus of ♂ genitalia not of this shape . . . . . 3
- 3 Parafacials entirely haired. Tarsi reddish yellow to reddish and concolorous with tibiae. Surstylus of ♂ genitalia broad basally with an anteromedian toothlike process, deeply excavate between this process and apex (Text-fig. 56) *R. dentata* sp. n. (p. 81)
- Parafacials bare or at most only haired at extreme upper ends. Tarsi blackish, much darker than tibiae. Surstylus of ♂ genitalia strongly and evenly tapering to sharp apex (Text-fig. 57) . . . . . *R. setosa*

## *Rutilia (Rutilia) dentata* sp. n.

(Text-fig. 56)

[Specific name alludes to a tooth-like process on ♂ surstylus.]

♂. *Head.* Ground colour dark brownish or blackish on occiput and genal dilations and parafrontals, light tawny brownish or reddish on other parts; interfrontal area red-brown; pollinosity yellowish white. Parafrontal hair black, parafacial hair light golden orange (with a few dark hairs intermixed at extreme upper end of parafacial), genal hair pale yellow, occipital hair yellowish white. Vertex 0.13 of head-width. Frontal setae not, or only just, meeting at apices. Gena 0.35–0.39 of eye-height. Parafacial wide, about 3.8 times as wide as third

antennal segment, completely haired. Antennae brownish orange basally, third segment dark brown except for some bright orange-red colour at junction with second segment, falling short of mouth-margin by twice the length of the third segment; third segment about 2.1 times as long as second segment. Palpi tawny brown. *Thorax*. Ground colour brownish or blackish, a little reddish on sides around the sutures of the pleurites; dorsum with dark coppery pink tinge to naked eye, and with traces of greenish yellow reflections under microscope (especially along transverse suture); trace of greenish reflection on sternopleura. All dorsal hair black; hair of pleural regions light yellow to pale golden orange, except for some blackish hairs on the upper and posterior parts of the mesopleura; hair also blackish on sides of humeral calli. Scutellum with 6-7 pairs of marginal setae (apicals included), the apicals as strong as the other marginals. Thoracic chaetotaxy not noticeably spiniform. *Wings*. Basicosta black. Wing membrane nearly clear hyaline, entirely microtrichiate. Calyptrae semi-translucent pale brownish, with pale yellow hair fringe. *Legs*. Reddish or reddish yellow except for some brown to blackish brown darkening on coxae and basally on femora, tarsi concolorous with tibiae. Most of the coxal hair and the long soft posterior hair of the fore and mid femora, also the long hair of the basal anterior surface of the hind femora, pale yellowish; other leg hair black, except for the usual reddish hair on the *a* and *av* surfaces of the fore tibia. Chaetotaxy of mid and hind tibiae variable: mid tibia either without or with one or two minute *ad* setae; hind tibia with short regular inconspicuous *ad* fringe (with or without a distinct *ad* seta submedially in the fringe), and with one or two *pd* setae. Claws long. *Abdomen*. Slightly paler than thorax, dark reddish brown with some darkening of hind margins of intermediate tergites (which appear slightly blackish to naked eye), and with a narrow blackish median line; intermediate tergites with slight coppery purple reflections and with traces of coppery green reflections in some lights; these tergites largely overlaid with very thin whitish pollinosity which is hardly at all visible to naked eye. All abdominal hair black except for a few pale yellowish hairs at extreme base of venter; long hairs and setae of T<sub>5</sub> with reddish apices. T<sub>3</sub> with a row of many median marginal setae, these rather short and slightly stubby. Dorsal hair of T<sub>1</sub> + 2 and T<sub>3</sub> recumbent, that of T<sub>4</sub> semi-recumbent basally but erect distally, hair of T<sub>5</sub> very long and fine and entirely erect. Sternite 5 with each lobe very slightly excavate on apical margin. Genitalia with cerci and surstyli as in Text-fig. 56; surstylus of unusual form, very broad basally and with a blunt prong or tooth-like process on anterior edge submedially, excavate between this tooth and the apex, and bearing some extraordinary multifid setae on inner surface directed inwards. *Measurements*. Large species, body length about 16-18 mm, wing length about 15-17 mm.

♀. Generally similar to ♂ except that the abdomen is much more black and has the whitish pollinosity of the intermediate tergites much more conspicuous, purplish reflections less noticeable. Some pale yellow hair present on notopleural swellings and on extreme sides of scutum (below supra-alar setae). Frons with one pair of well developed proclinate orbital setae. Vertex 0.23-0.25 of head-width. Size as in ♂.

#### MATERIAL EXAMINED

Holotype ♂, AUSTRALIA: Victoria, Monbulk. In British Museum (Natural History), London.

Paratypes. AUSTRALIA: 1 ♂, 2 ♀, same data as holotype (one ♀ with year date '1895' on label in addition to words 'Monbulk Victoria'). 1 ♀, Victoria, Grampians, Reed's Lookout, 23.xii.1953 (*B. McMillan*). All paratypes in British Museum (Natural History).

DISTRIBUTION. Known only from south-eastern Australia.

AFFINITIES. Closely allied to other species of *Rutilia* s.str. and perhaps most closely to *R. (R.) selosa* Macquart, from which it differs most notably in the key characters cited above. The genitalia, with their remarkable form of surstyli, are

most distinctive, and no other Rutiline is known in which a surstylus of this shape occurs (Text-fig. 56) or in which the genitalia have strong setae with divided apices.

### Subgenus **GRAPHOLOSTYLUM** Macquart **stat. n.**

*Grapholostylum* Macquart, 1851 : 196 (223). Type-species: *Grapholostylum dorsomaculatum* Macquart, 1851, by monotypy.

*Agalmia* Enderlein, 1936 : 433. Type-species: *Rutilia albopicta* Thomson, 1869 [= *Grapholostylum dorsomaculatum* Macquart, 1851], by original designation. **Syn. n.** [Junior homonym preoccupied by *Agalmia* Enderlein, 1934 (Muscidae)].

**DIAGNOSIS.** Parafrontals pollinose, not metallic. Epistome and genae not metallic. Facial carina slightly flattened to strongly convex on anterior surface, outline convex in profile and sharply distinguished from lunula; epistome prominent. Parafrontals bare or haired. ♀ proclinate orbital setae usually absent, at most one pair (sometimes present one side and absent the other). Arista long-pubescent to short-plumose. Humeral callus with 4 setae, usually well developed. Posthumeral setae one or two. One very strong *post ia* seta [one specimen seen with small second *post ia*]. Scutum without supernumerary prescutellar setae. Postalar callus with three strong setae. Suprasquamal ridge haired. Scutellum convex dorsally without flattening towards apex; 4-6 pairs of marginal setae; with row of well developed preapical setae before the marginals. Pteropleuron not haired in front of level of posterior sternopleural seta. Two strong sternopleural setae (1 + 1) [one specimen seen with small second anterior *stpl*]. Prosternum bare; prosternal membrane bare or sparsely haired (variable in same species). Hind tibia without anterodorsal fringe, usually two distinct *ad* setae and two or three *pd* setae. Last abdominal tergite without median depression, evenly convex across its width and sides strongly tapering posteriorly (hypopygium prominent and well visible in profile). T<sub>3</sub> without median marginal setae or with one pair or with a transverse row of semi-erect small median marginals developed to variable extent; T<sub>3</sub> with lateral marginal setae. T<sub>5</sub> with some long fine erect discal setae (often irregular in ♂ but tending to form transverse preapical row in ♀). Sternite 5 of ♂ acuminate posterolaterally and with a submedian pair of conspicuous downwardly directed prominences (Text-fig. 33), these visible in situ in profile. ♂ genitalia with apical membranous part of distiphallus whip-like, exceptionally long and slender (about twice as long as sclerotized basal part of distiphallus: Text-fig. 38), surstyli long and narrow and cerci longer than surstyli (Text-fig. 64). [Medium-sized to large species with white pollinose spots over mesopleura and sternopleura and often with white pollinose spots distinguishable over humeral calli to notopleura and in supra-alar areas].

**DISTRIBUTION.** Eastern Australia from Tasmania to Queensland.

**DISCUSSION.** *Grapholostylum* was originally described by Macquart (1851) as a genus allied to *Rutilia* having one included species, viz. *G. dorsomaculatum*. For many years the identity of Macquart's genus remained enigmatic, but Townsend (1932 : 38; 1936 : 153; 1938 : 416) rightly showed that *Grapholostylum* is a true Rutiline. Regrettably, Enderlein (1936 : 441), guessing from the description of Macquart and overlooking Townsend's (1932) paper, decided that the genus belonged to the Ameniinae and placed it near *Amenia* Robineau-Desvoidy—a rather bad case of misidentification, which was corrected by Crosskey (1965 : 103-106), who showed that the misidentified *G. dorsomaculatum* sensu Enderlein is actually *Amenia sexpunctata* Malloch. For the present work Macquart's type-material of *G. dorsomaculatum* (including the lectotype designated elsewhere: Crosskey (1971 : 271)) has been studied in detail and Townsend's placement in the Rutilini found to be correct; it should be emphasized, however, that the name applies to a valid species

and is *not* a synonym either of *Rutelia decora* Guérin-Méneville or of *R. splendida* (Donovan) as Townsend stated (1932 : 38-39; 1938 : 416). On the other hand, the name is a senior synonym of *Rutelia albopicta* Thomson (syn. n.), the type-species designated by Enderlein (1936) for his genus *Agalmia*, and because of this specific synonymy the generic name *Agalmia* Enderlein, 1936, is a new synonym of *Grapholostylum* Macquart. (Here it should be noted that *Agalmia* of Enderlein (1936) in the Rutiliini is a junior homonym of *Agalmia* Enderlein (1934) in the Muscidae; no replacement name is needed as *Agalmia* Enderlein, 1936, is itself a synonym.)

*Grapholostylum*, as here redefined as a subgenus within *Rutelia* s.l., contains a small number of species that are very distinctive in the ♂ fifth sternite and ♂ hypopygial characters but which do not differ very strikingly on their other characters from certain other *Rutelia*. Certainly on the features of head form, chaetotaxy, arisal hairing, and abdominal shape the subgenus shares many characters in common with the subgenus *Microrutelia* Townsend, and in the presence of a well formed transverse row of median marginal setae on T<sub>3</sub> there is a marked resemblance between one of the species of *Grapholostylum*, viz. *subtustomentosa*, and the subgenus *Rutelia* s.str. However, *subtustomentosa* has the ♂ sternite 5 and hypopygial characters exactly as in *dorsomaculata* (I can find no real differences at all between the genitalia of the two species), and *subtustomentosa* is assignable to subgenus *Grapholostylum* and not to *Rutelia* s.str.

Sternite 5 in the male in this subgenus is shaped as in Text-fig. 33; the sides of the sternite are drawn out to sharp points and there is a pair of large blunt downwardly directed submedian lobes with a deep narrow cleft between them. The submedian prominences are easily visible on the abdomen when seen in situ and project conspicuously in profile; the hind margin of the sternite is clearly excavate between the submedian prominence and the lateral extremity of the sternite. A ♂ sternite 5 of this form occurs nowhere else in the Rutiliini, and therefore makes *Grapholostylum* an especially distinctive segregate.

The aedeagus in *Grapholostylum* differs from that of all other subgeneric segregates of *Rutelia* s.l. The membranous distal section of the distiphallus is exceptionally long and slender, rather whip-like (Text-fig. 38), and about twice as long as the sclerotized proximal section (which is of normal length); in other *Rutelia* s.l. the distal section of the distiphallus is either shorter than, or about subequal in length to, the proximal section. Species of subgenus *Grapholostylum* have, in fact, the most elongate form of aedeagus found in the Rutiliini. Another slight difference in the aedeagus between *Grapholostylum* and other *Rutelia* subgenera lies in the shape of the epiphallus: in *Grapholostylum* the epiphallus, seen in profile, is widest well beyond the junction of the distiphallus (Text-fig. 38), whereas in other subgenera the epiphallus is widest at its base (i.e. near the junction with the distiphallus) and contracts thence towards its apex (Text-fig. 37).

Apart from the genital differences, *Grapholostylum* differs from *Rutelia* s.str. by lacking a median dorsal excavation in the last visible abdominal tergite (T<sub>5</sub>) and by having a convex scutellum which lacks any definite flattening before the apex. Differences between *Grapholostylum* and *Microrutelia* are discussed under the latter subgenus.

The type-species, *R. (G.) dorsomaculata*, of this subgenus has white pollinose markings on thorax and abdomen (to which Macquart's name refers), but in general the spots are less bold and obvious than those found in the subgenus *Ameniamima* (q.v.), though they are mainly developed at the same sites—in humeral, supra-alar, mesopleural and sternopleural positions. The white spots give *dorsomaculata* and *albovirida* (the latter is possibly not specifically distinct from the former) some superficial resemblance to *Ameniamima* species, but *Grapholostylum* differs much from *Ameniamima* on the genital features already noted and by having three postalar setae (four in *Ameniamima*) and a haired suprasquamal ridge (bare in *Ameniamima*).

The size and colouring in *dorsomaculata* are rather variable, females ranging from bright green to dark blackish green with coppery tinges, and males having a light tawny brown abdomen with broad black median vitta. All specimens, however, have the white pollinose markings on the thorax and less obvious white pollinose areas (somewhat shifting in appearance) on the abdomen; the thoracic pattern appears always to include a pair of small submedian white spots medially on the scutum just in front of the scutellum (spots in this position do not occur in *Ameniamima* but are found in some of the Ameniine Calliphorids of the genus *Amenia* Robineau-Desvoidy, which slightly resemble the brighter green specimens of *Grapholostylum* species). As a result of the variability, and because earlier authors misunderstood Macquart's species, *dorsomaculata* has several synonyms (which are here newly established after examination of types). Malloch's species *Rutilia albovirida*, described from the female, is probably the same as *dorsomaculata* but at present there is insufficient evidence to establish definite synonymy.

*Rutilia micans* Malloch belongs in this subgenus and is rather intermediate between *dorsomaculata* and *subtustomentosa* in hair colour and degree of development of the white pollinose spots (the pattern of these is identical to *dorsomaculata* but they are less conspicuous in *micans*).

#### INCLUDED SPECIES

*Rutilia (Grapholostylum) albovirida* Malloch. AUSTRALIA (Queensland). [Holotype examined].

*R. (G.) dorsomaculata* (Macquart). AUSTRALIA (New South Wales). [Lectotype examined].

*albopicta* Thomson **syn. n.** [Holotype examined].

*fuscisquama* Malloch **syn. n.** [Holotype examined].

*leucosticta* Schiner **syn. n.** [Holotype examined].

*variegata* Bigot **syn. n.** [Lectotype examined].

*R. (G.) micans* Malloch. AUSTRALIA (Australian Capital Territory, New South Wales). [Holotype examined].

*R. (G.) subtustomentosa* Macquart. AUSTRALIA (Tasmania). [Holotype examined].

*velutina* Bigot **syn. n.** [Lectotype examined].

#### KEY TO SPECIES OF THE SUBGENUS *GRAPHOLOSTYLUM*

- 1 Entire vestiture of the fore coxae orange or golden red. Bristling of fore femora red.

Prostigmatic and propleural setae red. All mesopleural hair and pteropleural vestiture yellow or golden orange. Scutum without submedian white spots. Mesonotum extensively tinged with light mauve-pink colour. Abdomen of both sexes with transverse row of many small median marginal setae on T<sub>3</sub>. ♀ abdomen without white spots. [Tasmania] . . . . . ***R. subtusomentosa***

- Vestiture of fore coxae all black or with at least the main bristling black. Bristling of fore femora black. Prostigmatic and propleural setae black. Mesopleural hair partly or completely black, pteropleural vestiture partly black (at least the strongest hairs black). Scutum with a pair of submedian white pollinose spots (in addition to supra-alar pair), sometimes faintly marked. Mesonotum not extensively mauve-pink, sometimes coppery pink in prescutellar area. Abdomen normally without or with only one pair of median marginal setae on T<sub>3</sub> (occasional specimen with row of four or five such setae developed). ♀ abdomen with some diffuse white pollinose spots, usually including a pair of submedian spots on each intermediate tergite (sometimes only visible as fly is turned) . . . . . 2
- 2 Hair of sternopleuron pale yellow. Hair of abdominal venter entirely pale yellow (♂) or pale yellow ventrally on T<sub>1</sub> + 2 and T<sub>3</sub> (♀). Hair of coxae partly or mainly orange or golden red. At least some of mesopleural hair yellow. [A.C.T. and New South Wales] . . . . . ***R. micans***
- Hair of sternopleuron entirely or mainly black. Hair of entire abdominal venter black (both sexes). Hair of coxae entirely or almost entirely black. All mesopleural hair black . . . . . 3
- 3 Size smaller, length 10–12 mm. Mesonotum brilliant metallic emerald-green or golden green, without noticeable darker vittae when seen by naked eye. Lower half of postorbit bright golden orange or yellow and upper part silvery white, transition of the colouring rather abrupt. [Queensland] . . . . . ***R. albovirida***  
 [Only known from ♀, possibly not specifically distinct from *dorsomaculata*]
- Size larger, length 12–18 mm. Mesonotum not brilliantly shining, sometimes green but more often very dark olive-green to greenish brown and with some darkish vittae evident to naked eye. Upper half of postorbit pale yellowish and not strongly contrasting in colour with yellow or orange-yellow lower half, if upper part rather white then normally not abruptly contrasted in colour with lower part (transition of colouring more gradual). [New South Wales] . . . . . ***R. dorsomaculata***

### Subgenus **MICRORUTILIA** Townsend

*Microutilia* Townsend, 1915 : 23. Type-species: *Rutilia minor* Macquart, 1846, by original designation.

*Prosenostoma* Townsend, 1932 : 39. Type-species: *Senostoma flavipes* Brauer & Bergenstamm sensu Townsend (misidentification) [= *Rutilia* (*Senostoma*) *hirticeps* Malloch], by original designation. **Syn. n.**

*Eucompsa* Enderlein, 1936 : 400. Type-species: *Rutilia minor* Macquart, 1846, by original designation. [Isogenotypic synonym of *Microutilia* Townsend and junior homonym pre-occupied by *Eucompsa* Enderlein, 1922 (Tabanidae)].

*Pogonagalmia* Enderlein, 1936 : 435. Type-species: *Rutilia* (*Senostoma*) *hirticeps* Malloch, 1929, by original designation. **Syn. n.**

[*Senostoma* sensu authors, not Macquart. Misidentification.]

**DIAGNOSIS.** Parafrontals pollinose or almost completely so, at most only metallic at extreme upper ends in ♀. Epistome and genae not metallic. Facial carina convex on anterior surface, and strongly convex and well marked off from lunula in profile, upper part often very bulbous; epistome strongly nasute. Parafacials bare or haired. ♀ proclinate orbital setae in one or two pairs, rarely absent. Arista long-pubescent to short-plumose. Humeral callus with 4 setae, rather strong. One or two posthumeral setae. Normally two strong *post ia* setae, occasionally

only one in ♂, sometimes small third seta in front of main pair. Scutum without supernumerary prescutellar setae. Postalar callus with three strong setae. Suprasquamal ridge haired. Scutellum convex, not at all flattened before apex; 4-5 pairs of marginal setae (occasional specimen with three only on one side); with row of preapical setae in front of marginals. Pteropleuron not haired in front of level of posterior sternopleural seta. Two or three sternopleural setae (1 + 1 or 2 + 1). Prosternum bare; prosternal membrane normally bare, rarely one or two hairs. Hind tibia with short fringe or with irregular sparse long fringe, with one main *ad* seta if fringe close-set but otherwise with several distinct *ad* setae, with three *pd* setae (occasionally more). Last abdominal tergite without median depression, evenly convex across its width and sides strongly tapering posteriorly, hypopygium very prominent. T<sub>3</sub> without median marginals or with a few weakly developed; T<sub>3</sub> with lateral marginal setae. T<sub>5</sub> with long erect discal setae. Sternite 5 of ♂ downwardly prominent and conspicuous in profile, each lobe angulate posterolaterally (Text-fig. 32) and very slightly concave on its hind margin. ♂ genitalia with distal membranous part of distiphallus shorter than sclerotized proximal part, surstyli broad basally and slightly tapering to blunt end (Text-figs 60-63), sharply pointed at tip in *nigriceps*. [Small or very small species of coppery green, emerald, or blue-green colour in which scutellum often violaceous and male often with tawny yellow abdomen showing black median vitta and cupreous or green tinges to ground-colour].

**DISTRIBUTION.** Eastern Australia from Tasmania to Queensland, probably also Western Australia.

**DISCUSSION.** This subgenus is aptly named for, as redefined here, it still contains the smallest species of *Rutilia* s.l., and *R. (M.) minor*—the type-species—is the smallest of all Rutiliini (as little in some specimens as 6-7 mm long). Enderlein (1936) erected the genus *Eucompsa* for *R. minor*, but evidently realized before final publication of his paper that Townsend (1915) had already proposed the genus *Microrutilia* for the same species: thus *Eucompsa* is proposed on p. 400 of Enderlein's (1936) work and promptly sunk into synonymy with *Microrutilia* on p. 415 of the same work. Apart from being a junior isogenotypic synonym the name *Eucompsa* Enderlein, 1936, is also a junior homonym of one of Enderlein's own generic names, being preoccupied by Enderlein's (1922) use of *Eucompsa* in the Tabanidae. Even for Enderlein it was unusually careless nomenclature to publish a junior objective synonym and a junior homonym in the same name.

The type-species of *Pogonagalmia* Enderlein, namely *R. hirticeps* Malloch, differs from typical *Microrutilia* only in having the parafacials haired and in slight shape differences (considered specific only) in the ♂ cerci and surstyli, and none of these distinctions would justify separating *hirticeps* from *Microrutilia*; *hirticeps* is here considered to be consubgeneric with *minor* and the genus-group name *Pogonagalmia* therefore goes into synonymy with *Microrutilia*.

Townsend's generic name *Prosenostoma* is based upon a misidentification of Brauer & Bergenstamm's species *Senostoma flavipes*, and Townsend's (1932 : 39; 1938 : 420) *flavipes* (described in the *Manual of Myiology* as having haired parafacials) is the species *hirticeps* Malloch. The true *flavipes* Brauer & Bergenstamm has bare parafacials, and is a quite different species. However, both Brauer & Bergenstamm's true *flavipes* and Townsend's misidentified *flavipes* (= *hirticeps*) are here treated as consubgeneric, and no nomenclatural difficulty arises from Townsend's misuse of the name *flavipes*: *Prosenostoma* enters into new synonymy with *Microrutilia*.

Townsend's error arose from mis-recognition of the types of *flavipes*. *Senostoma flavipes* was described by Brauer & Bergenstamm (1889 : 126) from a ♂ and a ♀ specimen from 'Neu Holland' and Engel (1925 : 375) recorded these specimens as 'Typen No. 38 u. 39'. At the same time Engel noted that the Vienna Museum contained two ♀ specimens collected by Thorey in Western Australia in 1864; it was these specimens that Townsend wrongly considered to be the types of *flavipes* Brauer & Bergenstamm. In his 1932 work, in which the name *Prosenostoma* was proposed, Townsend recorded a 'Female Ht [holotype] in Wien, labelled "Thorey: 1864: Austr. occid."' and in the 1938 work (*Manual of Myiology*, 7 : 420) he again recorded 'Ht female from West Australia in Vienna'; Townsend's notes in the United States National Museum, Washington, show that there were two specimens, both ♀, with the data 'Thorey 1864 Austr. occid.', one being his 'holotype' in Vienna and the other a specimen taken by Townsend from the Vienna collection for his own genotype collection (the specimen that Townsend obtained from Vienna is still in U.S.N.M. and has been examined). The two ♀ specimens from Western Australia mentioned by Townsend in his notes (one his supposed holotype) are the same two ♀ as Engel had recorded as ordinary specimens without type-status. The true *flavipes* types are the specimens recorded by Engel as 'Typen' from 'Neu Holland'; these have the parafacials bare and are a different species from the 'Thorey 1864 Austr. occid.' females, apparently being specimens of *R. (M.) hirticeps* Malloch. A lectotype is designated from the true type-material of *flavipes* elsewhere in this paper (see p. 121). Comparison of this specimen with the lectotype of *fulviventris* Bigot shows that *flavipes* must fall as a synonymy of *fulviventris*.

Brauer & Bergenstamm (1889) completely misunderstood Macquart's genus *Senostoma* (type-species *S. variegata* Macquart), which is not even a Rutiliine (Paramonov, 1968 : 384; Crosskey, 1971 : 291), and were seriously in error to place *flavipes* in this genus. In reality it belongs to the genus-group segregate later described by Townsend as *Microrutilia*. Unfortunately both Engel (1925 : 374) and Malloch (1929 : 305, 1930 : 109) followed Brauer & Bergenstamm's erroneous interpretation of *Senostoma*, and applied the name *Senostoma* to the concept which should correctly be called *Microrutilia*; hence the entry of *Senostoma* of authors, not Macquart, in the foregoing synonymy of *Microrutilia*.

*Microrutilia* is an easily recognized subgenus because of the combination of small size, three postalar setae, conspicuously haired arista, very prominent nasute epistome and bulbous facial carina, and in the male the unusually prominent sternite 5 and hypopygium. It appears to be most closely related to *Grapholostylum* with which it shares a large number of characters (compare diagnoses), and it is possible that new species discovered in the future may show intermediate characters making it necessary to amalgamate the two subgenera. At present *Microrutilia* is easily distinguished from *Grapholostylum* by the differently formed ♂ sternite 5 (Text-fig. 32) and by the short membranous distal part of the aedeagus (which is shorter than the sclerotized proximal part); other differences include the lack of white spotting on thorax, the presence normally of two posterior intra-alar setae (though there is variability and some specimens of *Microrutilia* have only a single *post ia* seta as in *Grapholostylum*), and the more strongly developed proclinate orbital bristling (nor-

mally two pairs in *Microrutilia* females and one or none in *Grapholostylum*) and sternopleural bristling (commonly 2 + 1 sternopleurals in *Microrutilia* and almost always only 1 + 1 in *Grapholostylum*).

An interesting feature of the chaetotaxy of *Microrutilia* (apart from the unusually long and strong bristles) is the constancy of the posterior dorsocentral setae. In most *Rutilia* s.l. the number of *post dc* is rather variable within species, and therefore within any particular subgenus, and the degree of development may differ between sexes or on one side of the scutum from the other in the same specimen, but in *Microrutilia* there are very constantly four long strong *post dc* setae regularly spaced (as they would be in a higher Tachinid with this number of *post dc* setae); the same constancy of four unusually long strong *post dc* setae (combined with four rather strongly developed humeral setae) occurs in *Grapholostylum*, and perhaps is another indicator of close phyletic relationship between the two subgenera in spite of the rather different male sexual characters of *Microrutilia* and *Grapholostylum*.

Some species of *Microrutilia* have a superficial resemblance to some *Chrysorutilia* species because of their metallic green upper occiput and postbuccae, and because of the very convex non-sulcate end of the abdomen (T5); but the presence of three postalar setae (instead of 4 or 5 as in *Chrysorutilia*), the lack of pteropleural hair anterior to the *post stpl* seta, and the short sparse hairing of the suprasquamal ridge (contrasted with the long dense bushy hairing of *Chrysorutilia*) readily distinguishes *Microrutilia* from *Chrysorutilia*. In *Microrutilia*, also, there are strong erect setae present among the hair of abdominal T5, whereas in almost all *Chrysorutilia* species this tergite bears fine hair only. The shape of the ♂ sternite 5 is also different in the two subgenera.

Correct association of the sexes in *Microrutilia* is especially difficult, particularly as the males and females of many if not most of the species (*hirticeps* is an exception) appear to be sexually dimorphic in leg colour; females have the legs reddish yellow, but males have the legs partly or completely darkened (mainly black or brownish black at least on the coxae, parts of the femora and the tarsi). Some of the nominal species in the subgenus are based on ♂ primary types and others on ♀ types, and it is well-nigh impossible at present (in the absence of bred material or good series collected in the same place at the same time) to be sure how the females correlate with the males; it is almost certain, though, that some of the names involved are synonyms of each other. Some authors have already established synonymies based on guess-work correlations: Brauer (1899 : 513) placed *flavipes* as a synonym of *minor*; Austen (1907 : 345) placed *liris* as a synonym of *minor*; Engel (1925 : 374) placed *flavipes* as a synonym of *ruficornis*; and Townsend (1938) accepted Austen's and Engel's synonymies. During the present work it has been found that there is a very difficult complex of species involved that are all very closely alike, though differing on male genitalia, and that it is almost impossible to say which females associate with the different species recognizable on male genitalia. Although at least one of the previously established synonymies is almost certainly correct, viz. that of *liris* with *minor*, it seems best to regard all the names based upon female types as valid for distinct species until such time as really good evidence is available for positive association of males and females; in the absence of such evidence I here

cite the relevant names as valid in the list of included species and in the key to species.

An interesting feature of most *Microrutilia* species is the relatively large size of the epandrium of the ♂ hypopygium and its exceptionally rotund form; this is well seen, for example, in Text-fig. 62, showing the apical view of the epandrium of *R. minor*. The large epandrium tends to make the genitalia appear very prominent when in situ, an appearance enhanced by the unusually prominent ♂ sternite 5.

#### INCLUDED SPECIES

***Rutilia (Microrutilia) cupreiventris*** Malloch **stat. n.** AUSTRALIA (New South Wales). [Holotype examined].

***R. (M.) fulviventris*** Bigot. AUSTRALIA ('New Holland', Tasmania). [Lectotype examined].

*flavipes* (Brauer & Bergenstamm) **syn. n.** [Lectotype examined].

***R. (M.) hirticeps*** Malloch. AUSTRALIA (New South Wales, Victoria, Western Australia). [Holotype examined].

*pallens* Curran **syn. n.** [Holotype examined].

[*flavipes* Brauer & Bergenstamm sensu Townsend. Misidentification.]

***R. (M.) liris*** (Walker). AUSTRALIA (Tasmania). [Holotype examined].

***R. (M.) media*** Macquart. AUSTRALIA (Tasmania to New South Wales). [Lectotype examined].

*ruficornis* (Macquart) **syn. n.** [Holotype examined].

***R. (M.) minor*** Macquart. AUSTRALIA (Tasmania). [Lectotype examined].

***R. (M.) nigriceps*** Malloch. AUSTRALIA (New South Wales). [Holotype examined].

***R. (M.) nigripes*** (Enderlein) **comb. n.** AUSTRALIA (A.C.T., QUEENSLAND). [Lectotype examined].

#### KEY TO SPECIES OF THE SUBGENUS *MICRORUTILIA*

[Note: Only a small number of female specimens has been available, and some of the key characters given for females may not be found to be constant with longer series.]

- |   |   |                               |
|---|---|-------------------------------|
| 1 | Parafacials completely haired. ♂ surstyli and cerci as in Text-fig. 63. Legs of both sexes entirely reddish yellow . . . . .  | <b><i>R. hirticeps</i></b>    |
| — | Parafacials bare. ♂ surstyli and cerci differently shaped. Legs mainly blackish brown in ♂, reddish yellow with dark tarsi in ♀. . . . .  | 2                             |
| 2 | Femora reddish yellow (♀♀) . . . . .  | 3                             |
| — | Femora blackish brown, at most a little reddish basally (♂♂) . . . . .  | 6                             |
| 3 | Abdomen bicolorous, dark green to greenish black dorsally and yellow-orange on most of venter; last abdominal tergite (T <sub>5</sub> ) covered with thick whitish pollinosity and therefore contrasting in colour with remainder of abdominal dorsum. Pleural regions reddish yellow with only slight golden green and violaceous metallic glints. Mesopleural hair pale yellow (except for a few dark hairs anterodorsally) |                               |
|   |   | <b><i>R. fulviventris</i></b> |
| — | Abdomen unicolorous, golden green or emerald or cupreous green on both dorsum and venter; last visible tergite not noticeably pollinose, therefore shining like remainder of abdomen. Pleural regions mainly metallic golden green or blue-green. Hair of mesopleuron black (except for some pale hair along extreme anterior edge) . . . . .   | 4                             |
| 4 | Basicosta bright orange. Parafrontals not metallic at upper ends. Sternopleural   |                               |

hair pale yellow. Abdomen partly cupreous. Proclinate orbital setae in one pair only or none definitely developed. 1 + 1 sternopleural setae

[Possibly the ♀ of *R. media*]

***R. cupreiventris***

- Basicosta blackish brown or at least dark brown anteriorly. Parafrontals showing metallic green colour at upper ends on to vertex. Sternopleuron with hair entirely black or black on upper part around and between the *stpl* setae. Abdomen all golden green or emerald. Two pairs of strongly developed proclinate orbital setae. Normally 2 + 1 *stpl* setae (occasionally only 1 + 1) . . . . . 5

- 5 Abdominal tergites 3 and 4 without discal setae and with entirely recumbent hair; T<sub>3</sub> without median marginal setae. Sternopleural hair all black. Ground colour of lower parts of parafrontals reddish and not noticeably contrasting in any light with the reddish yellow ground colour of parafacials. Setae of the upper part of the postocular row short and straight . . . . . Undetermined sp.

[Possibly the ♀ of *R. nigripes*]

- Abdominal tergites 3 and 4 with some long fine irregular discal setae distinctly developed among the hair, the hair sub-erect medially on T<sub>3</sub> and erect all over T<sub>4</sub>; T<sub>3</sub> with a row of about four long fine median marginal setae. Sternopleural hair black around and between the *stpl* setae but pale yellowish on mid part of sternopleuron. Ground colour of parafrontals blackish and in some lights contrasting rather abruptly with reddish yellow ground colour of parafacials. Setae of the upper part of the postocular row rather long and fine and curved slightly forwards . . . . . ***R. liris***

[Probably the ♀ of *R. minor*]

- 6 Hair of pleural regions and abdominal venter pale yellow. Hair of fore coxae mainly golden . . . . . Undetermined sp. or spp.

[Possibly ♂ of *R. fulviventris*. ♂ genitalia similar to *R. nigripes*. Specimens from Queensland have extremely narrow upper frons as in *nigripes*, measuring 0.05-0.06 of head-width. Other specimens from Victoria have frons at narrowest from 0.065-0.08 of head-width. Queensland specimens belong to *R. ruficornis* sensu Enderlein, not Macquart. They may possibly be a colour polymorph of *nigripes*.]

- Hair of pleural regions and abdominal venter almost all black. Hair of fore coxae black (at most a few golden hairs at extreme base and apex) . . . . . 7
- 7 Ground colour of parafrontals entirely blackish. Very small species (length 6-9 mm) with exceptionally long fine bristling and hairing. ♂ surstyli and cerci as in Text-fig. 62 or Text-fig. 109 . . . . . 8

- Ground colour of parafrontals tawny reddish or brownish, at most only a little blackish at upper ends. Larger species (length 9.5-15 mm) with vestiture not exceptionally long and fine. ♂ surstyli and cerci of different shape (Text-figs 60 & 61) . . . . . 9

- 8 Ground colour of parafacials blackish and concolorous with parafrontals. ♂ surstyli and cerci as in Text-fig. 109, surstyli with sharp apical point and cerci sinuous in profile. Frons at narrowest point distinctly wider than third antennal segment

***R. nigriceps***

- Ground colour of parafacials yellow and rather sharply contrasting with the blackish parafrontals. ♂ surstyli and cerci as in Text-fig. 62, surstyli rounded apically and cerci straight in profile. Frons at narrowest point subequal in width to or very slightly narrower than third antennal segment . . . . . ***R. minor***

- 9 Eyes exceptionally strongly approximated, interfrontal area almost completely obliterated at its upper end, frons at narrowest point only 0.05-0.06 of head-width. ♂ genitalia with free apical parts of cerci not much longer than the contiguous basal parts, and the outer margins of the bases of the cerci rounded (Text-fig. 61). [Queensland] . . . . . ***R. nigripes***

- Eyes less strongly approximated, upper part of interfrontal area narrow but distinct, frons at narrowest point 0.075-0.08 of head-width. ♂ genitalia with exceptionally

large heavy cerci (Text-fig. 6o) in which the free apical parts are much longer than the contiguous basal midline of the cerci; the outer margins of the basal parts of the cerci rather straight. [Tasmania and New South Wales] . . . . *R. media*

SUBGENERALLY UNPLACED SPECIES-GROUP TAXA IN *RUTILIA* s.l.

These are two, *micropalpis* Malloch, 1929 and *scutellata* Enderlein, 1936. Each is briefly discussed below.

*Rutilia micropalpis* Malloch

This little-known species differs from all other species of *Rutilia* s.l. so far described by having the palpi (as the appropriate specific name indicates) exceptionally small; they are very inconspicuous in the buccal cavity and their length is at most only about half the normal palpal length in *Rutilia*. I would not exclude the species from any named subgenus on this character alone, but on the basis of all the other characters shown by *micropalpis* in combination it is impossible to place the species at all satisfactorily in any one of the seven subgenera here recognized, and it seems best to leave *micropalpis* subgenerically unplaced for the time being. The male is unknown to me, and so far I have seen only four female specimens (holotype and paratype in Australian Museum and two specimens in British Museum (Natural History)). Other than the palpal character these are the features shown by *micropalpis*:

Head pollinose, non-metallic; parafacials bare; ♀ with one pair of strong proclinate orbital setae; arista micropubescent; four humeral setae (one sometimes very weak); one to three post-humeral setae (variable each side on same specimen); two or three *post ia* setae (if three then anterior one very small); no supernumerary prescutellar setae; four or five postalar setae; suprasquamal ridge with short black hair, rather sparse; scutellum convex, with four or five pairs of marginal setae and with well developed preapicals; pteropleuron not haired in advance of hind *stpl* seta; two sternopleural setae (1 + 1, anterior one exceptionally strong); prosternal membrane and anterior edge of prosternum with long pale hair; hind tibia with short very regular and close-set *ad* fringe along its basal three-fifths and with or without one strong *ad* seta inserted at the end of the fringe, with three or four strong *pd* setae; abdominal T<sub>3</sub> with one pair of median marginal setae; T<sub>5</sub> without depression and with a median transverse row of very strong erect setae; body colour dark blackish green with coppery to purplish reflections (mainly on mesonotum and scutellum) and thin whitish pollinosity over humeral area, mesopleuron, and (very thinly) on tergite bases.

If the foregoing list of *micropalpis* characters is compared with the subgeneric diagnoses it is evident that the closest fit lies with subgenus *Donovanius*, though the species fails to conform with typical species of this subgenus by having short sparse suprasquamal ridge hairing, some hair present on the prosternum, by the very short hind tibial fringe and several strong hind tibial *pd* setae, and by the lack of a depression in the last abdominal tergite. *R. micropalpis* seems to combine some of the characters of *Donovanius* with some of *Rutilia* s.str. There is no suggestion, or very little, of any affinity with the other subgenera, even though these possess four or more postalar setae as in *micropalpis*.

It would not be unjustified on the basis of its unusual palpi and combination of other characters to place *micropalpis* in a separate new subgenus, but one is not

proposed at present because the male is still unknown; the male genitalia might well give a better clue to the affinities than any of the female characteristics known so far. If it should prove, as seems possible, that the male of *micropalpis* has genitalia of the *Donovanius* type (with large heavy foliaceous surstyli) then it might be best to assign *micropalpis* to this subgenus in spite of its somewhat aberrant features such as the reduced palpi.

*Chrysorutilia media* var. *scutellata* Enderlein

This variety was described from a single female (holotype) collected at Adelaide, South Australia, and the description consists of the five words 'Scutellum dunkel rostfarben ohne Metallglanz'. The holotype is probably in the Berlin Museum where it should correctly be located, but was not found there when other Enderlein types were borrowed for this work. In the absence of the type I cannot place the name *scutellata*, but it presumably applies to a species of *Chrysorutilia* (most probably as a synonym). It almost certainly has nothing to do with *media* Macquart, which belongs in the subgenus *Microrutilia* and was clearly misidentified by Enderlein (though specimens named as *media* by Enderlein have not been seen).

Genus *AMPHIBOLIA* Macquart

*Amphibolia* Macquart, 1843 : 278 (121). Type-species: *Amphibolia valentina* Macquart, 1843, by original designation and monotypy.

DIAGNOSIS. Facial carina widest above middle and distinctly convergent ventrally, rounded on anterior surface, upper part often rather bulbous. Epistome moderately to strongly prominent, face strongly excavate in profile between epistome and carina. Head of ♂ not holoptic, upper eye facets not enlarged, separated by a distance much greater than width of facial carina. Genal dilation well developed. Parafacials haired or bare. Buccal opening normal, very much wider than facial carina. Head pollinose, non-metallic. Arista pubescent. Palpi normal, fully developed. Mentum short and rather broad in profile with subparallel sides. Prosternum bare, prosternal membrane bare or haired. Scutellum with apical pair of setae inserted at lower level than other marginal setae (very rarely absent); total of 4-6 (7) pairs of marginals; disc of scutellum not flattened. Postalar callus with 3-4 setae (occasional specimen with small supernumeraries in addition). Postalar wall bare. Suprasquamal ridge thickly haired. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate. Abdomen with marginal vestiture of tergite venters weak and semi-recumbent (directed backwards), if slightly spiniform (as in *assimilis*) then not directed vertically downwards; T<sub>3</sub> with median marginal setae (often numerous and in strongly developed transverse row); intermediate tergites with discal setae (absent in occasional specimens). T<sub>5</sub> convex above and broadly truncate subconical, without depression or at most with only very slight apicomedian hollowing.

DISTRIBUTION. Australia and Tasmania, Lord Howe Island, New Guinea. Occurring in Australia from Western Australia to Victoria and New South Wales; represented, but apparently poorly, in Queensland.

DISCUSSION. It is by no means certain that *Amphibolia* ought to be considered generically distinct from *Rutilia* s.l., and it is maintained here as a separate genus with considerable doubts as to whether this is fully justified. In the past none of the earlier workers on the Rutiliini have doubted its generic distinctness, but the fact is

that most of the characteristics of *Amphibolia* conform exactly or very closely with those of *Rutilia* in the wide sense and that it is difficult to find really convincing characters for generic separation. The type-species, *A. valentina*, remained for many years the only known species and seemed very distinct from all the *Rutilia* species because of the exceptionally unusual and conspicuous bold black-and-white pattern of the thorax and abdomen, a pattern that elsewhere in the Rutiliini occurred only in the superficially similar species *Formosia speciosa* Erichson; now, however, that more species are known through the work of Paramonov (1950, 1968) it is clear that *valentina* is not nearly so distinctive as it seemed, and that other species of *Amphibolia* such as *A. campbelli* Paramonov, though having the black-and-white pattern, have features of the facies, strength and arrangement of the chaetotaxy and so forth that suggest rather close affinity to, particularly, the segregates *Paramphibolia* and *Chaetogastrina*. The two species contained in these hitherto monotypic genera look very different from *Amphibolia* when arranged in a collection, because they lack the black-and-white pattern, yet they do not differ (apart from pattern) from typical *Amphibolia* on their structural characters to any greater extent than do many of the species of *Rutilia* or *Formosia* differ from their more typical congeners. Considering the range of known species in *Amphibolia*, *Paramphibolia* and *Chaetogastrina* as a whole, therefore, it seems best to treat them in an equivalent manner to the species here placed in *Rutilia* s.l. by merging them into a single genus and widening the generic definition of *Amphibolia* accordingly. But the form of the male hypopygium and fifth sternite which is essentially very similar in *assimilis* and *stolida* (type-species respectively of *Paramphibolia* and *Chaetogastrina*) differs slightly from that of typical *Amphibolia* species, and for this reason (taken in conjunction with the striking pattern difference) it is considered best to recognize two subgenera, distinguished by the same order of difference as that distinguishing the various subgenera here recognized in *Formosia* and *Rutilia*.

The main characteristics distinguishing *Amphibolia* s.l. from other Rutiliine genera are as follows: suprasquamal ridge haired (distinction from *Formosia*, *Formodexia*, *Chetogaster*, *Rutilodexia* and *Prodiaphania*), postalar callus with three or four setae (distinction from *Chetogaster*), palpi normal and arista micropubescent (distinction from *Prodiaphania*); head entirely pollinose, non-metallic (distinction from *Chrysopasta*); facial carina contracted or evanescent ventrally (distinction from *Rutilia* s.l.); intermediate abdominal tergites (T<sub>3</sub> and T<sub>4</sub>) almost always with discal setae (distinction from all other genera except *Chetogaster*).

*Amphibolia* s.l. is most nearly allied to *Rutilia*, and the distinctions between these time-honoured genera are rather intangible. In general in *Rutilia* the facial carina is rather broad, often flattened on the fore surface, and not strikingly evanescent at its ventral end, whereas in *Amphibolia* the carina is conspicuously best developed on the upper part (which may be obviously bulbous) and weakly developed with the sides much convergent at the ventral end. Nearly always in *Amphibolia* there are a few erect discal setae present on tergites 3 and 4, but occasionally specimens lack abdominal discal setae on these tergites or one of the tergites may have only a single seta; on the other hand discal setae are apparently never present on the intermediate tergites in *Rutilia* (though doubtless some specimens of this genus will

ultimately be found that possess adventitious discals). But presence or absence of discals on T<sub>3</sub> and T<sub>4</sub> is a useful rule-of-thumb distinction between *Amphibolia* and *Rutilia*. Those *Rutilia* (a few species) which have the suprasquamal ridge bare are immediately separable from *Amphibolia* by this character (all known species of *Amphibolia* have the suprasquamal ridge fully haired). Likewise those *Rutilia* species that have a very broad medially depressed T<sub>5</sub> are at once separable from *Amphibolia*, which does not have a deep median depression in this tergite (the last tergite in all *Amphibolia* species is truncate subconical with scarcely any trace of flattening or hollowing medially at the tip).

The two subgenera of *Amphibolia* are distinguished by the following key:

KEY TO THE SUBGENERA OF *AMPHIBOLIA*

- 1 Thorax and abdomen with bold black-and-white pattern. Lobes of fifth sternite of ♂ simple. ♂ hypopygium with surstyli shorter than cerci (Text-figs 87-89). Apical pair of scutellar setae approximately as strong as other scutellar marginal setae . . . . . **AMPHIBOLIA** Macquart (p. 95)
- Thorax and abdomen without such pattern. Lobes of fifth sternite of ♂ with small tooth or prong on inner edge near apex (Text-figs 34 & 35). ♂ hypopygium with surstyli longer than cerci (Text-figs 85 & 86). Apical pair of scutellar setae much weaker than other marginal setae (sometimes absent)

**PARAMPHIBOLIA** Brauer & Bergenstamm (p. 100)

Subgenus *AMPHIBOLIA* Macquart

*Amphibolia* Macquart, 1843 : 278 (121). Type-species: *Amphibolia valentina* Macquart, 1843 by original designation and monotypy.

**DIAGNOSIS.** Thorax black with bold discrete white-pollinose spots on dorsum. Calyptrae black or brownish black. Scutellum with apical pair of setae subequal in size to other marginal setae. Abdomen conspicuously patterned in contrasting black and white-pollinose areas. Thoracic and abdominal chaetotaxy not spiniform. Lobes of ♂ fifth sternite simple, without subapical tooth on inner edge. ♂ hypopygium with short broad surstyli (often slightly bifurcate) which are shorter than cerci.

**DISTRIBUTION.** Australia and Tasmania, Lord Howe Island, New Guinea.

**DISCUSSION.** This subgenus includes some of the most attractive and beautifully marked flies among the whole of the Rutiliini which are at once recognized by eye from their bold black-and-white coloration of the thorax and abdomen combined with their bright yellow heads. Not all species, however, which belong in the subgenus are quite so distinctive, for some have the white areas less boldly displayed than others, and not all of them have the yellow head colour. In general the species fall into two groups, one including the type-species (*valentina*) in which the head is mainly yellow or at most reddish brown and the abdomen has (as part of the pattern) discrete rounded black spots, and another including species in which the head ground colour is distinctly black and in which the abdomen (though possessing a pattern) lacks definite isolated black spots; these two groups, which are both Australian, are however interconnected by a new species (*papuwana*) here described from New Guinea, which has the black ground colour of the head but also has discrete

black abdominal spotting. As there is intergradation between the species it is not proposed to recognize formal species-groups.

The species of *Amphibolia* s. str. show some variability in the development of the chaetotaxy. In *A. ignorata* the bristling is especially weak and exceptionally short on the head and abdomen, and the head bristling is also very weak in *A. valentina* (in both these species the frontal setae are so short and fine that the rows are not cruciate and scarcely meet at the tips), but in *A. campbelli* all the setae are long and strong and the chaetotaxy of this species is almost identical with that of *A. stolidia* in the subgenus *Paramphibolia*. In *A. campbelli* (and also the closely similar *A. wilsoni*) the hairing as well as the chaetotaxy is more strongly developed than in other species, the parafacials being entirely haired (these are bare in all the species in which the head ground colour is either all bright yellow or all blackish). The pollinosity of the upper parafacials and lower parafrontals in *A. campbelli* has a shifting appearance according to the direction of the light which is unusual in Rutiliini, but recalls a rather similar condition found on the head of *Chrysopasta elegans*, and it is possible that the monotypic genus *Chrysopasta* has closer affinity with *Amphibolia* than with any other genus of Rutiliines.

An astonishing convergent resemblance exists between the black-and-white boldly patterned *Amphibolia* s.str. species and some other Calyptrate flies with similar patterning. In the subgenus *Euamphibolia* Townsend (q.v.), a segregate of *Formosia* s.l., and in the Ameniine Calliphorid genus *Formosiomima* Enderlein (see Crosskey, 1965), the thorax and abdomen has a black-and-white pattern formed in exactly the same way as in *Amphibolia*. In all of these flies the thoracic dorsum is black with thickly pollinose white marks in pairs on (1) the notopleural to humeral area, (2) the prescutum, (3) the supra-alar area, and (4) on the scutum submedially (these last sometimes evanescent), to which basic pattern there may be superimposed additional white-pollinose marks (usually in the form of one or two longitudinal vittae between the paired prescutal sublateral marks). The abdominal patterns are less constant throughout the range of species, though constant within a species, but the nature of the pattern is the same—being formed of areas of extensive thick overlay of white pollinosity contrasting with areas of black ground colour devoid of such pollinosity. In all three taxa of these apparent mimics, *Amphibolia*, *Euamphibolia* and *Formosiomima*, part of the abdomen appears black-spotted, each black spot in reality being an island (or a confluent pair of islands) not covered by the white-pollinose overlay. Some specimens of all three taxa also have a suggestion of greenish or violaceous tinge showing through the pale pollinose areas (an interference effect of the pollinosity overlying the blackish ground colour).

Paramonov (1968 : 357) states that *Amphibolia* species are parasitic on larval cockchafer. This is most probably correct, though Paramonov's evidence came only from a specimen of *A. valentina* in the CSIRO collection, Canberra, that was collected in Victoria and bears a label reading 'larvae of these flies parasitic on cockchafer grubs'.

#### INCLUDED SPECIES

*Amphibolia* (*Amphibolia*) *albocincta* (Malloch). AUSTRALIA (Australian

Capital Territory, New South Wales). [Holotype examined].

**A. (A.) campbelli** Paramonov. AUSTRALIA (Australian Capital Territory, New South Wales, Victoria). [Holotype examined].

**A. (A.) commoni** Paramonov. AUSTRALIA (New South Wales, Victoria).

**A. (A.) ignorata** Paramonov. AUSTRALIA (Western Australia to Victoria to Queensland); LORD HOWE ISLAND. [Holotype examined].

**A. (A.) papuana** Crosskey **sp. n.** NEW GUINEA. [Described below].

**A. (A.) valentina** Macquart. AUSTRALIA (Western Australia to Victoria to Queensland, Tasmania).

*vidua* (Guérin-Méneville). [Syntypes lost].

**A. (A.) wilsoni** Paramonov. AUSTRALIA (Victoria).

#### KEY TO SPECIES OF THE SUBGENUS *AMPHIBOLIA*

- 1 Parafacials bare . . . . . 2
- Parafacials completely haired . . . . . 6
- 2 Head yellow to orange-red with thick yellow to golden orange pollinosity. Hair of genae and postbuccae golden yellow . . . . . 3
- Head black (at most slightly reddish on genae) with whitish or ashy grey pollinosity. Hair of genae and postbuccae black. [Only ♀♀ known] . . . . . 4
- 3 Last visible abdominal tergite (T<sub>5</sub>) entirely black. Submedian pair of black spots on T<sub>3</sub> standing close together and normally coalesced before hind margin of the tergite. Pattern of abdominal T<sub>4</sub> consisting of two very large semi-circular black marks which meet and fuse in the mid-line (usually also a pair of very minute inconspicuous black dots in the white-pollinose area near the mid fore margin of the tergite). Vertex of ♂ 0·11-0·12 of head-width. Surstylus of ♂ genitalia as in Text-fig. 87 . . . . . **A. ignorata**
- Last visible abdominal tergite (T<sub>5</sub>) with black-and-white pattern, sides of the tergite thickly white pollinose to a variable extent. Submedian pair of black spots on T<sub>3</sub> not meeting each other at hind margin of tergite, very clearly separated by white pollinose area which extends back in mid line to hind margin of tergite. Pattern of T<sub>4</sub> consisting of four large black spots standing against hind margin of tergite, an isolated lateral pair and an inner pair of rounded spots which fuse in the mid-line (occasional specimen may have lateral spot larger than usual and just meeting with the inner spot); T<sub>4</sub> in addition always with a pair of small but distinct submedian black dots near fore margin. Vertex of ♂ wider, 0·14-0·15 of head-width. Surstylus of ♂ genitalia as in Text-fig. 88 . . . . . **A. valentina**
- 4 Abdominal T<sub>3</sub> with a thick covering of whitish pollinosity and a black spot pattern consisting of a large transverse median spot and a pair of lateral spots standing on the hind margin of the tergite (in addition a very small black V-shaped area encroaching on white pollinose area anteriorly in the mid-line). [New Guinea] **A. papuana** sp. n. (p. 98)
- Abdominal T<sub>3</sub> without a pattern of black spots, the black areas of the tergite in form of transverse bands. [Australia] . . . . . 5
- 5 Abdominal T<sub>3</sub> almost completely covered with thick white pollinosity (only very narrowly black against hind margin), abdomen therefore appearing to have a broad white fascia sub-basally . . . . . **A. albocincta**
- Abdominal T<sub>3</sub> mainly black, with only a narrow basal band of whitish pollinosity which is discontinuous at the mid-line . . . . . **A. commoni**
- 6 Vertex of ♂ 0·13-0·14 of head-width. Prescutum with a median whitish pollinose vitta which (seen in some lights) is more or less continuous to the transverse suture. Surstyli and cerci of ♂ genitalia as in Text-fig. 89 . . . . . **A. campbelli**

- Vertex of ♂ unusually narrow, about 0.09 of head-width. Median whitish vitta of the prescutum evanescent posteriorly, not reaching to suture . . . . . *A. wilsoni*  
[This species is known only from the ♂ holotype. The genitalia have not been examined.]

***Amphibolia (Amphibolia) papuana* sp. n.**

♀. *Head*. Ground colour mainly blackish, except for yellowish facial carina and reddish brown genal and postbuccal regions; parafrontals and interfrontal area black; head pollinosity white, thinner on parafrontals than elsewhere (in some lights lower end of parafrontal shows distinct line of demarcation where thicker pollinosity on parafrontals and bottom end of parafrontal meets area of thinner pollinosity on parafrontal). Parafrontal and occipital hair black, genal and post buccal hair dark reddish brown. Frontal setae short and very fine, tips of opposite rows not meeting; one pair of divaricate ocellar setae; two pairs of well developed proclinate orbital setae. Vertex 0.24 of head width. Facial carina longer than epistome, narrow and nearly subfusiform but slightly widened at level with junction of second and third antennal segments and very slender on ventral third; facial profile moderately excavate between epistome and carina. Gena exceptionally broad, about 0.55 of eye-height. Parafrontals very broad, about three and a half times wider than third antennal segment, entirely bare. Antennae slightly elongate, falling short of mouth-margin by about two-thirds of length of third segment; basal segments reddish with some black infuscation on inner edge of second segment, third segment blackish brown except for some bright orange colour at base; arista with short pubescence. Palpi tawny yellow. *Thorax*. Brownish black to black with bold white spots conspicuous to naked eye. Spots arranged as pair of large humeral-notopleural marks, pair of sublateral prescutal vittae (in which each vitta strongly contracted medially so that to naked eye the white vitta appears as separated spots), pair of slender median white vittae on prescutum between the sublateral vittae, pair of supra-alar spots on scutum and pair of submedian spots on scutum (these less boldly white than other spots); in addition prescutum with pair of very small spots standing against transverse suture just mesad of humeral-notopleural spots; mesopleuron and sternopleuron with large white spot; seen from in front prescutum shows trace of blue-green colouring under the anterior parts of the sublateral white vittae, and seen laterally scutum shows trace of coppery violaceous glints around supra-alar spots. All thoracic hair black. Chaetotaxy rather weak, three pairs of presutural acrostichal setae differentiated (standing on median white lines), two *post ia* setae, 1 + 1 sternopleural setae, no setae developed on inner half of humeral callus (only two setae on outer half). Scutellum with very strong crossed apical setae, three or four pairs of other marginals, and with well developed preapicals. *Wings*. Basicosta dark. Wing membrane hyaline except for boldly marked basal dark spot in which cells completely blackened. Calyptrae blackish brown with dark brown marginal hair. *Legs*. Blackish brown with all black hair. Chaetotaxy weak, most setae short and fine; mid tibia with only one distinct *ad* seta; hind tibia with very short weak *ad* fringe and with two main *ad* setae and two *pd* setae. *Abdomen*. With black-and-white pattern. T1 + 2 and T5 entirely black. T3 with thick covering of whitish pollinosity over most of surface, except for very small median anterior V-shaped black mark and three black spots against hind margin; black spots arranged as lateral pair on extreme sides of abdomen and a broad median spot. T4 black with a transverse fascia of thick whitish pollinose covering on anterior quarter or third, the pale pollinose area extending back to occupy nearly half the tergite length mid dorsally and extending black medioventrally to reach the hind margin. Greenish tinge visible on pale pollinose areas of T4 dorsum, and venter distinctly green under the pale pollinosity; black areas of venter with violaceous tinge in some lights. Pale pollinose parts of T3 and T4 together giving abdomen appearance of having a broad transverse pale band contrasting with the black base and apex. Abdominal hairing black, mainly short, fine and semi-recumbent, but longer and erect on T5 and medially on T4. T3 with one pair of erect median marginal setae. T3 and T4 without discal setae, but holotype (only available specimen) has one large pore (seta itself missing) on the anteromedian V-shaped black mark of T3 near the fore margin

of the tergite. T<sub>5</sub> without trace of median depression, with a transverse row of strong erect discal setae standing near the centre of the tergite. *Measurements.* Body length 14.7 mm, wing length 12.6 mm [holotype only].

♂. Unknown.

#### MATERIAL EXAMINED

Holotype ♀, NEW GUINEA: Murrumbidgee Pass, 8600 ft, x.1961 (*W. W. Brandt*). In British Museum (Natural History), London.

**DISTRIBUTION.** Known only from the holotype from highland New Guinea.

**AFFINITIES.** This is the first species of *Amphibolia* to be discovered in New Guinea. Although only a single specimen is so far known it has been considered desirable to describe the new species because its provenance is unexpected and because it shows very distinctive features which make it intermediate between two groupings of *Amphibolia* s.str. species present in the mainland Australian fauna. Paramonov (1968 : 356) found that the Australian species fell into two moderately distinct groups, one with mainly yellow head and with black abdominal spots and the other with blackish head and no black abdominal spots, and he used this distinction for the first cut in his key to the Australian species. The new species *A. (A.) papuana* here described has the black head colour of the second of Paramonov's groups but has bold black abdominal spots on T<sub>3</sub> like the first group, and seems on this account to occupy a rather intermediate position; on total facies, however, it appears most closely allied to *A. (A.) albocincta* (Malloch), a species with dark head and no black spots from New South Wales. From a zoogeographical viewpoint this possibility is of interest because it provides another instance of a curious fact of Tachinid distribution that is becoming more and more evident—that there are elements in the Tachinid fauna of the New Guinea highlands that are quite disjunct from the rest of the Papuan fauna but are beyond doubt extremely closely allied to similar or almost identical forms in the mountainous parts of New South Wales (with, apparently, a very wide gap in distribution in Queensland).

The holotype of *papuana* sp. n. differs from typical *Amphibolia* specimens by seeming to lack definite discal setae on the intermediate abdominal tergites, but careful examination shows the presence of a large pore anteromedially on T<sub>3</sub>, confirming that abdominal discals can be present in this species. The probability is that specimens are variable in the development of discal setae in *papuana*, as in other species of *Amphibolia*, and it is to be expected that specimens obtained in future will not necessarily conform completely with the holotype in this detail of the abdominal chaetotaxy.

As a whole the strength and development of the chaetotaxy in *papuana* sp.n. is closely similar to that of *A. (A.) ignorata* Paramonov, in both species the abdominal and leg chaetotaxy in particular being very weak. It is of interest to note also the close resemblance in the distribution of the pale pollinose overlay of the abdomen in these two species; the abdominal pattern is essentially extremely similar in *papuana* and *ignorata*, differing only in that *ignorata* has a pair of minute median black spots in addition in the centre of the pale pollinose fascia of T<sub>4</sub>, and the median black spot of T<sub>3</sub> in *ignorata* is clearly composed of two partially fused spots. But *ignorata* has the head bright yellow and the antennae orange and on this feature alone is at once

separable from *papuana* (a specimen in the BMNH collection from Queensland standing under the name *ignorata* and having the bright yellow head has the abdominal pattern exactly as in *papuana*, and might perhaps belong to a different species: the specimen is of interest in showing that flies with an abdominal pattern that is an exact match with that of the New Guinea species occur in mainland Australia, even though quite different on other characteristics).

Subgenus **PARAMPHIBOLIA** Brauer & Bergenstamm **stat. n.**

*Paramphibolia* Brauer & Bergenstamm, 1891 : 389 (85). Type-species: *Rutilia assimilis* Macquart, 1851, by monotypy.

*Chaetogastrina* Malloch, 1929 : 313. Type-species: *Chaetogastrina stolidi* Malloch, 1929, by original designation. **Syn. n.**

DIAGNOSIS. Thorax without bold white pollen spots. Calyptrae semi-translucent yellowish or brownish. Scutellum with apical setae weak, much smaller than other marginal setae and sometimes not developed at all. Abdomen not patterned in contrasting black and white-pollinose areas. Abdominal chaetotaxy strong to slightly spiniform. Lobes of ♂ fifth sternite with distinct tooth or small sharp prong subapically on inner edge. ♂ hypopygium with surstyli as long as the cerci.

DISTRIBUTION. South-eastern Australia and Tasmania only.

DISCUSSION. This subgenus contains only two known species, *Amphibolia* (*Paramphibolia*) *assimilis* and *A. (P.) stolidi* (Malloch), which are the type-species of *Paramphibolia* and *Chaetogastrina* respectively. Malloch's description of *Chaetogastrina* consisted only of the sentence 'This genus is very similar to *Paramphibolia*, agreeing with it in structure of the head and thorax, but there are no parafacial hairs below level of bases of antennae', from which it is evident that Malloch's only criterion for generic separation lay in the bare or haired parafacials. There is no doubt that in the Rutiliini as a whole there are many very closely allied species which differ in the degree of hairiness of the parafacials, some species belonging obviously to the same distinctive group having them bare, others partially haired, and others completely haired. In the present work no subgeneric or generic significance is attached to bareness or hairiness of the parafacials, a character considered to be specific only (though a few subgeneric segregates may have the same condition in all or most of the included species). Since there are no other notable differences between *assimilis* and *stolidi* (though their superficial appearance is different because of different body and hair colouring and because of the different degree of development of the abdominal setae) these two species are here treated as unquestionably congeneric and consubgeneric; hence the name *Chaetogastrina* is placed as a new synonym of *Paramphibolia*.

The new synonymy of *Chaetogastrina* with *Paramphibolia* is supported by evidence from the fifth sternite and hypopygium of the male (which were not examined by Malloch). In both *stolidi* and *assimilis* each lobe of the fifth sternite is produced on the subapical part of the inner margin into a small tooth, a development that is found (to the best of my knowledge) nowhere else in the Rutiliini. In fact throughout most of the Proseninae the lobes of the male fifth sternite are simple rounded structures without any specialized developments. There is no doubt that the small

blunt sternite tooth in *stolida* (Text-fig. 34) and the rather more prominent, sharper, tooth in *assimilis* (Text-fig. 35) are homologous, and good indicators of a recent common ancestry for these two species. The hypopygium itself is also similar in the two species in the degree of development of the surstyli: although these are different in shape, and quite conspicuously so, they are large and long in both species and in profile their apices reach to a level with the apices of the cerci. In *Amphibolia* s.str. the fifth sternite lobes are simple and rounded as in other Rutiliini without trace of a tooth, and the surstyli are much shorter than the cerci; hence the genital structures provide the most positive morphological features for the differentiation of *Paramphibolia* (syn. *Chaetogastrina*) and *Amphibolia* s.str.

Paramonov (1954 : 275, 1968 : 367) assigned Malloch's *Chaetogastrina stolida* to the genus *Chetogaster* Macquart, and therefore sank the name *Chaetogastrina* into synonymy with *Chetogaster*, but he gave no arguments in support of this curious conclusion. There is a slight superficial resemblance between *stolida* and, for example, *Chetogaster oblonga* (Macquart), but otherwise there is almost nothing to suggest any close relationship between *stolida* and *Chetogaster*; *stolida* has supernumerary setae on the postalar callus, haired suprasquamal ridge, fully haired barete, and other features completely characteristic of the *Amphibolia*-*Rutilia*-*Chrysopasta* complex of genera, and it is here concluded that Paramonov's placement of *stolida* (and therefore of *Chaetogastrina*) is much in error. Malloch (1929) was undoubtedly right to emphasize the close resemblance between *stolida* and *Paramphibolia*.

The bristling of the abdomen in *A. (P.) assimilis* is so characteristic that this species can be distinguished at a glance on this feature from all other Rutiliini; the setae are unusually thickened and abundant, there being a transverse row of many erect setae across the whole hind margin of T<sub>3</sub>, and exceptional strong development of slightly spiniform discal setae on T<sub>3</sub> and T<sub>4</sub> (these varying in number and arrangement but at least two always being present and very obvious on each tergite). Sometimes the strong discals of one or both intermediate tergites form a large cluster or an irregular transverse row.

Specimens of both *assimilis* and *stolida* are rare in collections, but on available evidence the two species appear to be allopatric: *assimilis* is found in Tasmania and Victoria, and *stolida* in the mountainous parts of New South Wales. Nothing is known of the host-relations.

#### INCLUDED SPECIES

*Amphibolia (Paramphibolia) assimilis* (Macquart) **comb. n.** AUSTRALIA (Tasmania, Victoria). [Lectotype examined].

*A. (P.) stolida* (Malloch) **comb. n.** AUSTRALIA (New South Wales). [Holotype examined].

#### KEY TO SPECIES OF THE SUBGENUS *PARAMPHIBOLIA*

- 1 Parafacials haired. Pleural regions of thorax with yellowish white to golden yellow hair (some dark hair on mid-mesopleuron). Abdomen mainly pale tawny brown (♂) to red-brown (♀) with distinct median black vitta. Abdominal chaetotaxy mainly strongly spiniform. Surstyli of ♂ genitalia as in Text-fig. 85. [Tasmania & Victoria] . . . . . *A. assimilis*

- Parafacials bare. Pleural regions of thorax with black hair. Abdomen very dark brownish black with indistinct median vitta. Abdominal chaetotaxy not unusually spiniform. Surstyli of ♂ genitalia as in Text-fig. 86. [New South Wales] . . . . . *A. stolidus*

### Genus *CHRYSOPASTA* Brauer & Bergenstamm

*Chrysopasta* Brauer & Bergenstamm, 1889 : 152. Type-species: *Chrysopasta versicolor* Brauer & Bergenstamm, 1889 [= *Rutilia elegans* Macquart, 1846], by original designation and monotypy.

*Roederia* Brauer & Bergenstamm, 1893 : 98. Type-species: *Chrysopasta versicolor* Brauer & Bergenstamm, 1889 [= *Rutilia elegans* Macquart, 1846], by monotypy (see text for explanation). [Junior homonym preoccupied by *Roederia* Mik, 1881].

*Echrysopasta* Townsend, 1932 : 39. Type-species: *Rutilia elegans* Macquart, 1846, by original designation.

*Euchrysopasta*: Paramonov, 1968 : 372-373. Incorrect subsequent spelling of *Echrysopasta* Townsend, without status in nomenclature.

**DIAGNOSIS.** Facial carina with prominent bulbous upper part contracting ventrally to a sharp narrow ridge. Epistome very strongly prominent, subnasute, face in profile deeply concave between epistome and carina. Head of ♂ not holoptic and upper eye facets not enlarged, frons much wider than facial carina. Parafacials densely long haired, hairing virtually continuous with that of genae. Buccal opening normal, much wider than facial carina in both sexes. Genal dilation strongly developed, extending forwards to or just beyond level of front of eye. Head pollinose anteriorly and on postorbits (pollinosity of lower parafrontals and postorbits with shifting chequered appearance), metallic on occipital and postbuccal regions. Arista micropubescent. Palpi medium size, much shorter than the unusually slender proboscis. Proboscis with slender mentum tapering slightly in profile towards labellae. Prosternum and prosternal membrane bare or haired (prosternum even strongly setose in some specimens). Scutellum with apical pair of setae inserted at lower level than other marginal setae; total of 4-5 pairs of marginals; disc of scutellum convex. Postalar callus with three setae. Postalar wall bare. Suprasquamal ridge haired. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate. Abdomen with marginal vestiture of tergite venters hairy only and semi-recumbent, no development of strong setae; T<sub>3</sub> without median marginal setae in ♂ or at most with one pair, with one or two pairs in ♀; intermediate tergites without discal setae (rarely T<sub>3</sub> or T<sub>4</sub> with one small stubby adventitious setula); T<sub>5</sub> truncate subconical without median depression, hypopygium of ♂ strongly prominent, surstyli as in Text-figs 91-94.

**DISTRIBUTION.** Western Australia only.

**DISCUSSION.** At present this genus is monotypic, containing only *Chrysopasta elegans* (Macquart). It is possible, however, that this species as now understood might be a species complex (see later discussion). Townsend (1932, 1938) considered that *elegans* is generically distinct from *versicolor* Brauer & Bergenstamm (the type-species of *Chrysopasta*) and proposed the genus *Echrysopasta* for *elegans*, but I agree with Paramonov (1968 : 373) that *elegans* and *versicolor* are congeneric (though specific synonymy is less certain) and therefore that *Echrysopasta* is a synonym of *Chrysopasta*. (Paramonov cited Townsend's name as *Euchrysopasta*, an incorrect subsequent spelling.) Comparison of the types (in British Museum (Natural History)) of *zabirna* Walker and *elegans* Macquart supports the synonymy of the former with the latter originally indicated by Malloch (1930 : 106) and recently

repeated by Paramonov (1968 : 372), although there are some slight differences in the ♂ genitalia.

The only other generic name involved in the synonymy of *Chrysopasta* is *Roederia* Brauer & Bergenstamm, which Townsend (1938 : 412) cited as an isogenotypic synonym of *Chrysopasta* with the type-species fixed by monotypy. When Brauer & Bergenstamm (1889 : 152) first described the genus *Chrysopasta* with its single species *versicolor* they placed the genus on its own in a family Röderiidae ('Gruppe XLIX' in their classification), without at that time describing a type-genus *Roederia* under this name; in their next work Brauer & Bergenstamm (1891 : 418) again listed *Chrysopasta versicolor* in 'XLIX. Gruppe Röderiidae' but still without a generic name *Roederia*. However in the next following part of their work Brauer & Bergenstamm (1893 : 98) published the name *Roederia* in a key to genera and *Röderia* in the generic index (*op. cit.* : 237), referring in the latter to the pages in their 1889 and 1891 works on which their Gruppe Röderiidae, containing only *Chrysopasta*, appeared. The name *Chrysopasta* does not appear in the generic key in the 1893 work, but this genus runs down to and conforms exactly with *Roederia*, and this fact together with the cross-references given in the 1893 index linking *Roederia* to Gruppe Röderiidae (and therefore to *Chrysopasta*, the only contained genus) leaves no doubt that *Roederia* Brauer & Bergenstamm and *Chrysopasta* are one and the same genus. I therefore agree with Townsend that *Roederia* is a synonym of *Chrysopasta* and that *versicolor* is its type-species by monotypy. A possible explanation for the confusion over the names is that Brauer & Bergenstamm, after deciding upon the name *Roederia* for this Rutiliine, realized that the name was preoccupied by *Roederia* Mik, 1881, and changed to *Chrysopasta*—but that the name *Roederia* got published in the 1893 work by an oversight instead of *Chrysopasta* in the generic key. No replacement name is, of course, required for *Roederia* Brauer & Bergenstamm because of its junior objective synonymy with *Chrysopasta*. Paramonov (1968) omitted *Roederia* completely from his treatment of *Chrysopasta*, without explanation.

Paramonov (1968 : 372) implied that *Chrysopasta* is so different from other Rutiliini when considered alongside some undescribed species known to him that it might be necessary later to refer the genus to some other tribe. Though these undescribed forms to which he referred are not known to me it does not seem probable on the basis of *elegans* that *Chrysopasta* could justifiably be excluded from the Rutiliines. It possesses so many of the uniquely or at least typically Rutiliine characteristics that it seems to me to be unquestionably a member of this tribe: for example it shows in combination such features as more than two postalar setae, thickly hairy suprasquamal ridge, frequently hairy prosternum and prosternal membrane, hairy barett, and completely Rutiliine body facies, which together would hardly permit it to be included in any other tribe (as least so far as the tribes of Prosenine Tachinidae are envisaged at present).

Within the Rutiliini the genus seems to be most nearly allied to *Amphibolia*, more especially to the subgenus *Paramphibolia*, with which *Chrysopasta* possesses in general more common features than with the other genera. There is much similarity in shape of the facial carina, the hairy suprasquamal ridge, the frequently strongly

haired prosternal regions, the head facies, and abdominal form, but *Chrysopasta* differs from *Amphibolia* s.l. by having the back of the head metallic, stronger and more extensive vestiture on the facial ridges, by the rather more slender mentum and smaller palpi, and by the weaker abdominal chaetotaxy (in which discal setae are absent on T<sub>3</sub> and T<sub>4</sub> except for the occasional occurrence of a small isolated adventitious setula).

The head in *Chrysopasta* shows some unusual features not found in quite the same form in other Rutiliini. The epistome reaches its most strongly nasute development among the whole tribe, being extremely prominent in profile and set off from the facial carina by a very deep concavity (Text-fig. 6), and the facial ridges are more strongly and extensively haired above the vibrissae than in other genera; the setae of the frontal rows also descend further down on to the extreme upper ends of the parafacials than in other genera, so that in profile there is a smaller gap than usual between the uppermost setulae on the facial ridges and the lowermost frontals. The parafacial hairing is more strongly developed than is normal and extends to a level below the bottom of the eye (the hairing virtually merging with the hairing of the genae); in other Rutiliini the parafacials, when haired, have the hairing only extending about to the bottom of the eye at most and there is a definite bare gap between genal and parafacial hairing. The postorbits in *Chrysopasta* are most characteristic, having silvery-white pollinose spots alternating with black (almost non-pollinose) spots, this being very obvious to the naked eye and having no counterpart elsewhere in the Rutiliines; somewhat similar pollinose areas having a shifting chequered appearance are present on the lower ends of the parafrontals.

In many specimens the mesonotal chaetotaxy is very strong. The humeral callus rather characteristically has only three setae set in a shallow triangle with the innermost seta unusually strong, but there is sometimes a weakly developed fourth seta laterad of the innermost strong one, so that the humeral chaetotaxy is basically the same as in other Rutiliini. When several specimens are examined the chaetotaxy is found to be much more variable than Paramonov's (1968 : 373) description indicates: one very strong *ph* (Paramonov's 'sublateral') is normal, but a second may be present;  $2 + 2$  *acr* is common, but there may be more presutural acrostichals than two; the *post dc* are usually four (length and strength very variable); often three or even four supra-alars; though usually only one strong *post ia* seta is present the female often has two very strong *post ia*. The sternopleurals are variably  $1 (2) + 1$  as Paramonov states. The legs of *Chrysopasta* are more strongly bristled than usual in Rutiliini and the claws and pulvilli are exceedingly large, especially in the male in which they are strikingly obvious to the naked eye; the hind tibia has a long antero-dorsal fringe but this does not form a regular close-set comb as in many Rutiliines, being composed instead of some fine rather hairlike setulae interposed between longer and stronger ones so that the fringe is irregular and loose (not comb-like); the *pv* apical seta of the hind tibia is much longer and stronger than usual.

The mesonotum has a bold pattern that is a little different from any other Rutiliine. The prescutum and scutum are pale silvery bluish and have four broad bold sooty black vittae that are discontinuous at the suture so that the scutum appears to have a transverse row of four elongate spots of black (of which the inner pair are

shorter and more quadrate than the outer pair). The abdomen is metallic greenish or bluish in ground colour except for the hind margins of the tergites which are brownish black, and the paler bases of T<sub>3</sub>-T<sub>5</sub> have an overlay of silvery or yellowish white pollinosity which gives the abdomen a transversely banded appearance.

Paramonov (1968) drew attention to the great variability of *Chrysopasta elegans*, and presuming that all the specimens so far available are truly conspecific then *elegans* is the most variable species in the Rutiliini. Paramonov did not mention the male genitalia, but these too differ greatly in different specimens (Text-figs 91-94). This casts considerable doubt on whether *elegans* and its supposed synonyms (*zabirna* and *versicolor*) are really one species, and suggests the possibility that a species-complex is involved. In general it does not seem likely that several distinct species occur within the relatively circumscribed area of south-west Western Australia (where *Chrysopasta* is apparently confined) yet, on the other hand, it would be very exceptional for a single species of Rutiliini (or any Tachinid) to manifest the diversity in the male genitalia that is to be found amongst specimens of *Chrysopasta*. The diversity in the male genitalia affects not only the size and shape of the cerci and surstyli, but also the size of the epandrium (which in some specimens is much bigger in relation to the cerci and surstyli than in other specimens). The Text-figs 91-94 exemplify the diversity amongst different male specimens: Text-fig. 91 shows an enlarged epandrium, very sharply pointed surstylus and very long tapering cerci found in a specimen from Newdegate, W.A.; Text-fig. 92 shows very broad foliaceous surstyli and unusually small cerci found in a specimen from 6 miles north of Watheroo, W.A.; Text-fig. 93 shows the shape of the surstyli and cerci in the holotype of *elegans* (exact locality unknown); and Text-fig. 94 shows the shape of the surstyli and cerci in the lectotype and paralectotype of *zabirna* from Perth, W.A.

Differences in male genital form of this order in other Rutiliini would normally imply distinct species and would normally be correlated with some constant, if minor, external differences. In the case of *Chrysopasta*, however, there is not at present nearly sufficient material available to determine whether the four distinct forms of male genitalia so far detected are discrete entities or whether they represent points along a range of variability (for example, when enough material is to hand it might prove that there is every gradation in surstylus shape from the sharp-pointed form of Text-fig. 91 to the broad rounded form of Text-fig. 92). The male genitalia do not, on the basis of present knowledge, provide adequate evidence as to whether *elegans* is one highly variable species or a complex of species; it therefore appears best to retain the names *zabirna* and *versicolor* in synonymy with *elegans*, and to consider all available material as conspecific, until more evidence can be adduced.

Variability exists in many external characteristics as well as in male genitalia. It is possible that some of the external differences may be found to correlate with the genital differences when sufficient material is studied, but no convincing correlation has so far been discovered. Most of the variable external features show a fairly complete gradation, e.g. the legs range from all reddish yellow to all brownish black and the prosternum and prosternal membrane show all conditions from bare to very strongly haired (or even bristled). Some specimens have mainly yellow pleural

hair and others black pleural hair (sometimes with pale hair on barettæ or pteropleuron), and the number of median marginal setae on abdominal T<sub>3</sub> varies in different specimens (there is also sexual dimorphism in these setae which are often absent in males but always present in females). The strength of the parafacial hairing varies greatly amongst females.

It may be useful to note the condition of some of these varying features in the primary types of *elegans* and *zabirna* in case it is later concluded that *elegans* is an admixture of species. In the holotype of *elegans* the legs are blackish brown with slightly more reddish tibiae, the pleural hair is black except for some golden hair on the lower pteropleuron and the barettæ, and the prosternum and prosternal membrane are strongly haired (the prosternum even bears one very long strong downwardly directed bristle on each side); in the lectotype of *zabirna* the legs are similar to *elegans* type, the pleural hair is also black but there are only a few pale hairs on the pteropleuron and all the barettæ hair is black, and the prosternum and prosternal membrane have a few strong hairs (but no definite bristle). The paralectotype specimen of *zabirna* is topotypic and unquestionably conspecific with the lectotype, but has the prosternum and prosternal membrane almost completely bare (one long recumbent hair on one side of the membrane, no hair at all on the prosternum itself); otherwise it agrees with the lectotype. (Townsend, 1932 : 39, noted the two strong prosternal setae in the holotype of *elegans*, as '2 PST', but his statement that the rest of the prosternum is bare is incorrect.) In the primary types of both *elegans* and *zabirna* the prosternal hair is black. The lectotype of *versicolor* could not be located for study during the present work.

The specimen from Newdegate with male genitalia as in Text-fig. 91 has mainly yellow pleural hairing (only mesopleural hair mainly black), has some long fine very pale yellowish hair on the prosternum, and has the legs entirely reddish yellow; the specimen from near Watheroo with male genitalia as in Text-fig. 92 has the pleural hair similar to that of the Newdegate specimen, but has the prosternum and prosternal membrane completely bare, and has the coxae and femora partly blackish-brown with the rest of the legs reddish.

Macquart (1846) recorded the provenance of *elegans*, at the time of description, as 'île Sydney' (New South Wales), and the holotype from Bigot's collection bears a label by Austen recording the locality as Sydney, New South Wales; the same type-locality was indicated in my paper on Macquart's Australian Tachinid types (Crosskey, 1971). It is now certain, however, beyond any real doubt that the type must have come from Western Australia: all later known material is from Western Australia, and it is here considered that Paramonov (1968 : 374) was right to regard Macquart's stated provenance as a mistake and to accept Western Australia as being the true type-locality.

Almost nothing is known of the early stages and host-relations of *Chrysopasta*. Malloch (1930 : 106) described the puparium from a specimen with its associated adult from Swan River, and stated that another specimen from this locality had a label reading '*Rutilia* sp. in nest of Termites, *Eut. westaustraliensis*'. It is extremely improbable that *Chrysopasta* has a termite host as the known hosts of Rutiliini are all coleopterous, and it should be assumed that there is no direct connection in the

life-history between *Chrysopasta* and termites: Townsend (1936 : 152), referring to Malloch's note, wrote that '*Echrysopasta* has been reared in West Australia from a puparium found in nest of *Eutermes*, but it is likely that the maggot was a white grub parasite whose host in the soil had accidentally become incorporated into the termite nest'. This is a reasonable supposition, and the reference to a possible inquiline relationship between *Chrysopasta* and termites made by Colless & McAlpine (1970) on page 737 of *The Insects of Australia* must be treated with caution.

#### INCLUDED SPECIES

- Chrysopasta elegans*** (Macquart). AUSTRALIA (Western Australia). [Holotype examined].  
*versicolor* Brauer & Bergenstamm.  
*zabirna* (Walker). [Lectotype examined].

#### Genus **PRODIAPHANIA** Townsend

*Diaphania* Macquart, 1843 : 277 (120). Type-species: *Diaphania testacea* Macquart, 1843, by monotypy. [Junior homonym preoccupied by *Diaphania* Hübner, 1818 (Lepidoptera).] *Prodiaphania* Townsend, 1927 : 159. Replacement name for *Diaphania* Macquart, 1843, preoccupied by *Diaphania* Hübner. Type-species: *Diaphania testacea* Macquart, 1843, by automatic fixation.

[*Senostoma* sensu authors, not Macquart. Misidentification.]

**DIAGNOSIS.** Facial carina broad and flattened, sides subparallel or only slightly convergent below, widely separating antennal bases. Epistome strongly prominent, subnasute, face in profile deeply excavate between epistome and carina. Head of ♂ not holoptic but frons strongly narrowed, not wider than facial carina, upper eye facets not enlarged. Parafacials haired on upper parts. Buccal opening elongate and strongly narrowed medially, at narrowest point subequal in width to or even a little narrower than facial carina. Genal dilation well developed. Head pollinose, non-metallic. Arista bushy plumose or long-pubescent. Palpi exceptionally small, sometimes papilliform, shorter than third antennal segment. Proboscis with mentum parallel-sided or at most only a little tapering in profile. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted conspicuously lower than other marginal setae; total of four to nine pairs of scutellar marginals; disc of scutellum convex. Postalar callus with four to six strong setae (three in holotype of *cygnus*). Postalar wall bare. Supra-squamal ridge bare. Upper calypter extraordinarily developed, subequal in length in both sexes to lower calypter. Tegula with normal long wiry posterior setulae. Costal base very strongly explanate (wings in resting position appearing to have prominent 'shoulders'). Abdominal venter without strongly developed setae on tergites; T<sub>3</sub> dorsally without median marginal setae or at most with one pair in ♀, marginals of T<sub>4</sub> short; no abdominal discal setae. T<sub>5</sub> truncate subconical, without median depression (at most with only slight flattening or hollowing at extreme tip).

**DISTRIBUTION.** Australia only; occurring from Western Australia to Victoria and north to Queensland, present in Tasmania.

**DISCUSSION.** There has been some confusion in the nomenclature of this distinctive genus, to which it is necessary to refer before considering the characteristics and affinities. Macquart's name *Diaphania* is preoccupied by Hübner's use of this name in Lepidoptera, but Brauer & Bergenstamm (1889 : 126; 1893 : 175) and Engel (1925 : 343)—being evidently unaware of the homonymy—continued to use *Diaphania* Macquart as a valid name; later, however, Townsend (1927 : 159)

realised the homonymy and published the replacement name *Prodiaphania*, which remains the valid name for this genus, and was used in publication by Malloch (1928b : 615; 1929 : 291) and Paramonov (1968 : 355, 384). Unfortunately, the name *Senostoma* Macquart has been misapplied to the genus, notably by Malloch (1936 : 10-15) and Townsend (1938 : 426), as the result of misidentification and erroneous synonymy of its type-species. *Senostoma* was described as a monotypic genus with *S. variegata* Macquart as its type-species, and Macquart's female holotype of *variegata* from the Bigot collection is in the British Museum (Natural History) (Crosskey, 1971 : 291); examination of this holotype shows that *variegata* (and therefore *Senostoma*) does not belong in the Rutiliini at all, but in the Prosenini near *Rhynchiodexia* Bigot (of which *Senostoma* may well be a senior synonym). Engel however found a female specimen in the collection of the Vienna Museum that belonged to the species *Diaphania testacea* Macquart (type-species of *Diaphania* = *Prodiaphania*) and bore a label erroneously purporting that it was Macquart's type of *variegata*, and Engel (1925 : 344) therefore synonymised *variegata* with *testacea*; Townsend (1932 : 40) saw the same specimen in Vienna and also considered that this synonymy was correct, recording it again later in his *Manual of Myiology* (Townsend, 1938 : 426). It seems certain that neither Engel nor Townsend troubled to compare the Vienna specimen with Macquart's (1847 : 96) original description of *Senostoma variegata*, from which it is obvious that it was not based on a Rutiliine specimen and that Macquart's figure (plate 5, fig. 3) scarcely resembles a *Prodiaphania* species. Their mis-recognition of the type led Townsend (1938) to supplant his name *Prodiaphania* with *Senostoma*, which would be nomenclaturally correct if the synonymy of *variegata* and *testacea* was correct; as it is not, and as *Senostoma* as correctly interpreted is not a Rutiliine, the name *Prodiaphania* Townsend stands valid for the present genus.

*Prodiaphania* is the most distinctive and easily recognized genus in the Rutiliini, and because of the external homogeneity of the species in conjunction with the presence of some unusual features can be more satisfactorily defined than the other genera. The palpi are minute (as Macquart noted in the original description of *Diaphania*) and this character alone separates *Prodiaphania* from all other genera, but other distinctive characters include the great enlargement of the upper calypter (which in the wings-closed position is as long as or nearly as long as the lower calypter), the unusual elongation of the head in the epistomal axis (Text-fig. 7) with consequent elongation of the buccal opening (Text-fig. 15), the conspicuously plumose or unusually long-pubescent arista on which the hairing is strikingly bushy, and the exceptionally explanate costal base (Text-fig. 26) giving the impression of basal 'shoulders' to the wings. Taken together these characters give *Prodiaphania* a very characteristic facies and set the genus rather apart from other genera; it is not possible to ascribe particularly close affinity to any other genus, but there is some notable resemblance in certain features such as the elongate buccal opening and explanate costal base to *Formodexia* gen. n. (but the very elongate palpi, normal upper calypter and haired postalar wall immediately distinguish *Formodexia* from *Prodiaphania*). The suprasquamal ridge is bare in *Prodiaphania* and this at once distinguishes the genus from *Chrysopasta*, *Amphibolia* and nearly all *Rutilia*, but the

reduced palpi and enlarged upper calypter already referred to also provide obvious differential characters from these genera.

The feature of enlarged upper calypter is most noteworthy, as enlargement of the *upper* calypter seems to occur nowhere else in the Tachinidae. Several unrelated Tachinids have the *lower* calypter enlarged, even to such an enormous extent in the male that the whole abdomen is covered by them, but the lower calypter is never enlarged in Rutiliini whereas the upper one is in *Prodiaphania*.

The species of *Prodiaphania* are extraordinarily uniform in their externals, although there are some minor differences in the leg chaetotaxy which can be used to differentiate certain species or groups of species in a key. But, luckily for the taxonomist, the male genitalia in *Prodiaphania* are more diverse and provide more uniquely distinctive characters for distinguishing species than in any other genus of Rutiliini, and both Malloch (1936) and Paramonov (1968) have made use of (and figured) the male genitalia of several species. Some of the developments in the genitalia of male *Prodiaphania* are rather bizarre (by the standards of Tachinidae) and include the enlargement of the surstyli into enormous flattened elliptical plates set in the transverse plane (in *georgei*), the development of a very large forwardly projecting process at the base of the surstylus (as in *furcata*) and the development of exceptionally dense tufts of long hair on the bases of the surstyli (as in *testacea*). Sometimes the male genital characters are very distinctive even when the external features show no evident reliable differences, and consequently dependable keys to the species need to be based mainly on the male genitalia. Females rarely show any reliable differences and it is difficult or well-nigh impossible to associate wild caught females with males.

Paramonov (1968) published a key to females as well as to males, and even described one species (*walkeri*) from a unique female holotype, but it seems to me that some of Paramonov's associations of females with males are very uncertain and in my view it is impossible at present to identify females reliably and therefore impossible to provide a workable key to them. Even Paramonov's key, on assumed associations of identity, seems very unsatisfactory, and *walkeri* (based only on the female) conflicts in the key characters with those cited in the description: in *walkeri* description (p. 400) the palpi are 'about as long as the third antennal segment' and the 'calypters of about same size', whereas the species is run out in the key (p. 387) by the couplets reading 'Upper calypter distinctly shorter than lower' and 'Palpi half as long as third antennal segment'.

In the present work it has been concluded that Paramonov's keys to *Prodiaphania* are not very satisfactory, and that only a key to males is practicable at this stage. I have therefore attempted to give here a revised key to males, based upon male genitalia together with the few external features that seem reliable, and have given figures of the male genitalia for as many species as I can (not all the types have been to hand during this work). Before giving this key, and the list of included species, it is necessary to allude to some of the nominal species which Paramonov (1968) included in *Prodiaphania*.

Paramonov (1968 : 391) assumed that *ruficornis* Macquart belonged in the genus, but this is incorrect; the male holotype of *ruficornis* has been examined and found to

belong to *Rutilia* (*Microrutilia*), in which subgenus the name is a synonym of *media* Macquart (see p. 90); Malloch was therefore right to place *ruficornis* in *Rutilia* and Paramonov wrong to place it in *Prodiaphania*. Regarding *vittata* Macquart, Brauer (1899 : 513) was right to place it in *Senostoma* auct. (= *Prodiaphania*), and Paramonov's (1968 : 401) supposition that 'Probably it [*vittata*] is a species of *Rutilia* or *Chetogaster*' is wrong; the female holotype (in London, not Paris as Paramonov thought) has been examined and found to be a *Prodiaphania* (almost certainly the female of *testacea* Macquart). Another incorrect supposition of Paramonov (1968 : 402) is that *echinomides* Bigot is probably not a *Prodiaphania*; Brauer (1899 : 512) placed this nominal species, under the misspelling *echinomyidea*, in *Diaphania* (= *Prodiaphania*) and examination of the female holotype during the present work has shown this to be correct (though the evidence that *echinomides* is a synonym of *testacea* as Malloch (1928c : 657) stated is not good: it appears unlikely that the specific synonymy is correct and it is here not accepted).

The early stages and host relations of *Prodiaphania* are still completely unknown.

#### INCLUDED SPECIES

- Prodiaphania arida*** Paramonov. AUSTRALIA (Victoria). [♂ paratype, data as holotype, examined].
- P. biarmata*** (Malloch). AUSTRALIA (South Australia). [Holotype examined].
- P. brevitarsis*** Paramonov. AUSTRALIA (New South Wales).
- P. claripennis*** Malloch. AUSTRALIA (Western Australia). [Holotype examined].
- P. commoni*** Paramonov. AUSTRALIA (South Australia, Victoria).
- P. cygnus*** (Malloch). AUSTRALIA (Western Australia). [Holotype examined].
- P. deserta*** Paramonov. AUSTRALIA (New South Wales, Queensland). [♂ paratype, data as holotype, examined].
- P. echinomides*** (Bigot). AUSTRALIA (? state). [Holotype examined].
- P. fullerae*** Paramonov. AUSTRALIA (New South Wales).
- P. funebris*** Paramonov. AUSTRALIA (South Australia, Western Australia).
- P. furcata*** (Malloch). AUSTRALIA (A.C.T., New South Wales, South Australia, Victoria). [Holotype examined].
- P. genitalis*** Paramonov. AUSTRALIA (A.C.T., New South Wales, Queensland, Victoria). [Holotype examined].
- paratestacea*** Paramonov **syn. n.** [♂ paratype, data as holotype, examined].
- P. georgei*** Malloch. AUSTRALIA (New South Wales, South Australia, Western Australia). [Holotype examined].
- P. minuta*** Paramonov. AUSTRALIA (Queensland). [♂ paratype, data as holotype, examined].
- P. regina*** (Malloch). AUSTRALIA (Queensland). [Holotype examined].
- P. testacea*** (Macquart). AUSTRALIA (Tasmania to Queensland).
- P. victoriae*** (Malloch). AUSTRALIA (Victoria to Queensland). [Holotype examined].
- P. vittata*** (Macquart). AUSTRALIA (South Australia). [Holotype examined: probably ♀ of *testacea*].
- P. walkeri*** Paramonov. AUSTRALIA (Western Australia).

KEY TO SPECIES OF THE GENUS *PRODIAPHANIA*

[Note: The following key is to males only. Females usually cannot be reliably associated with males, and it is considered that dependable keys to females cannot be given in the present state of knowledge; the three nominal species *echinomides*, *vittata* and *walkeri* cannot be included in the key as they have female holotypes which have not yet been associated with known males. *P. claripennis* is omitted as its male holotype has not been seen, and insufficient data is to hand for reliable inclusion.]

- 1 Sternites concealed, ventral ends of tergites meeting each other in mid ventral line of abdomen so that sternites are completely covered. Hind tibia without *pd* setae. Hind femur with some *pv* setae basally or submedially ♂ genitalia with large foliaceous surstyli orientated in the transverse plane (Text-figs 101, 106) 2
- Sternites exposed partially or completely, ventral ends of tergites separated from each other in mid venter of abdomen Hind tibia with one or more *pd* setae (very rarely none). Hind femur with or without *pv* setae. ♂ genitalia with surstyli not of this form . . . . . 4
- 2 Hind tibia with a secondary fringe of semi-erect setulae on the *a* surface in addition to the main *ad* fringe. [♂ genitalia not seen] . . . . . ***P. commoni***  
[No material has been seen of this species, which is only doubtfully distinct from *biarmata*]
- Hind tibia without a distinct secondary *a* fringe in addition to the main *ad* fringe (hairing of *a* surface all small, weak and virtually recumbent). ♂ surstyli and cerci as Text-fig. 101 or 106 . . . . . 3
- 3 ♂ genitalia with surstyli enormous in relation to epandrium and surstyli and cerci exceedingly slender in profile (Text-fig. 101). [Western Australia] ***P. georgei***
- ♂ genitalia with surstyli not exceptionally enlarged in relation to epandrium and surstyli and cerci much broader in profile (cerci broad basally and with very strong apical curvature) (Text-fig. 106). [South Australia] . . . . . ***P. biarmata***
- 4 Hind femur without any *pv* setae. Hind femur with *av* setae confined to apical third or half . . . . . 5
- Hind femur with some *pv* setae basally or medially (very few and rather weak in *victoriae*). Hind femur with *av* setae and long strong hairs irregularly along its whole length (except in *victoriae*, in which *av* setae confined to apical half) . . . . . 13
- 5 Surstylus of ♂ genitalia with a long forwardly directed basal process that is nearly as long as the main part of the surstylus or at least half as long (Text-figs 95, 96, 105) 6
- Surstylus of ♂ genitalia not of this form, if with a forwardly directed basal process this in the form of a short bluntly rounded lobe (Text-figs 97-100, 103, 104) . . . . . 7
- 6 Basal process of surstylus rounded apically and bearing a very long dense black hair tuft (Text-fig. 95) . . . . . ***P. testacea***
- Basal process of surstylus slightly bifurcate and pointed apically and with very short inconspicuous hairing (Text-figs 96 & 105) . . . . . ***P. furcata***
- 7 Surstylus of ♂ genitalia in profile strongly curved, very long and narrow, with sparse hairing confined to the basal part (e.g. Text-fig. 100) . . . . . 8
- Surstylus of ♂ genitalia in profile moderately broad and only at most slightly curved, usually (not *funnebris*) with rather long dense hairing on most of its length (Text-figs 97-99, 103, 104) . . . . . 9
- 8 Surstylus of ♂ genitalia extremely slender and of even width along its length (fig. 2C in Paramonov, 1968 : 388) . . . . . ***P. brevitarsis***
- Surstylus of ♂ genitalia slightly but distinctly clavate, narrower near the base than on apical half (Text-fig. 100) . . . . . ***P. genitalis***
- 9 Surstylus of ♂ genitalia as in Text-fig. 103, hairing mainly confined to basal third and consisting mostly of a moderately dense bunch of long strong hairs arising from a swollen rounded anterobasal prominence on the surstylus. Setulae of *ad* fringe

- of hind metatarsus very long and conspicuous. Hind tibia with a secondary fringe of irregular semi-erect setulae along the *a* surface in addition to the normal *ad* fringe . . . . . ***P. funebris***
- Surstyli of ♂ genitalia not as in Text-fig. 103, outer surface extensively hairy and only the tip bare, no definite anterobasal swelling. Setulae of *ad* fringe of metatarsus weak and inconspicuous or longer than metatarsal diameter. Hind tibia with or without a distinct secondary *a* fringe of semi-erect setulae in addition to main *ad* fringe . . . . . 10
- 10 Wings without the usual sub-basal dark mark. Surstyli of ♂ genitalia as in Text-fig. 97. Hind tibia without a secondary *a* fringe in addition to the normal *ad* fringe . . . . . ***P. minuta***
- Wings with the usual sub-basal dark brown mark. Surstyli of ♂ genitalia of slightly different form (Text-figs 98, 104, 108). Hind tibia usually with a row of distinct small semi-erect setulae along its length which form a secondary *a* fringe in addition to the usual *ad* fringe (setulae usually rather irregular) . . . . . 11
- 11 Surstyli of ♂ genitalia rather short and broad in profile, without noticeable curvature (as in Text-figs 98 and 104) . . . . . 12
- Surstyli of ♂ genitalia longer and more slender in profile and distinctly curved (Text-fig. 108) . . . . . ***P. regina***
- 12 Hind metatarsus with the setulae of the *ad* row extremely long and conspicuous, much longer than metatarsal diameter. ♂ cerci and surstyli as in Text-fig. 104 . . . . . ***P. deserta***
- Hind metatarsus with setulae of the *ad* row short and inconspicuous, not longer than metatarsal diameter. ♂ cerci and surstyli as in Text-fig. 98 . . . . . ***P. arida***
- 13 Hind femur with *pv* setae along the basal half. Hind femur with *av* setae of irregular size along its length. Wing without sub-basal dark mark. ♂ cerci and surstyli as in Text-fig. 107. [Western Australia] . . . . . ***P. cygnus***
- Hind femur with *pv* setae on the middle third of its length, none on the basal part. Hind femur either with irregular *av* setae and strong hairs along its whole length or with *av* setae confined to apical half. Wings with the usual sub-basal dark mark. ♂ cerci and surstyli as in Text-fig. 99 or Text-fig. 102. [Victoria to Queensland] . . . . . 14
- 14 Hind femur with the *pv* setae very long and strong, very much longer than diameter of femur. Hind femur with the *av* setae and strong hairs present all along its length. Surstyli and cerci of ♂ genitalia as in Text-fig. 99, surstyli broad and truncate and cerci not recurved at tips . . . . . ***P. fullerae***
- Hind femur with the *pv* setae weak and few (usually only two or three, sometimes only one) and only about as long as femoral diameter. Hind femur with *av* setae confined to apical half. Surstyli and cerci of ♂ genitalia as in Text-fig. 102, surstyli blade-like with acuminate apices and cerci slightly but distinctly recurved at tips . . . . . ***P. victoriae***

### Genus **CHETOGASTER** Macquart

*Chetogaster* Macquart, 1851 : 198 (225). Type-species: *Chetogaster violacea* Macquart, 1851, by monotypy.

*Codium* Enderlein, 1936 : 417. Type-species: *Rutilia oblonga* Macquart sensu Enderlein (mis-identification) [= *Chetogaster violacea* Macquart, 1851], by original designation.

*Chaetogaster*: incorrect subsequent spelling of *Chetogaster* Macquart, without status in nomenclature.

DIAGNOSIS. Facial carina elongate subfusiform or slightly flattened above and tapering ventrally to a sharp narrow ridge, always rather narrow. Epistome very strongly prominent, subnasute, face in profile deeply concave between epistome and carina. Head of ♂ not holoptic, frons very much wider than facial carina, upper eye facets not enlarged. Parafacials bare.

Buccal opening wide in both sexes, several times broader than facial carina. Genal dilation weakly developed, upper margin running obliquely from behind eye to lower margin of gena. Head pollinose, non-metallic. Arista pubescent. Palpi fully developed, sexually dimorphic (slender in males, conspicuously clavate in females). Proboscis with mentum parallel-sided in profile. Prosternum and prosternal membrane bare. Scutellum with apical pair of setae inserted only slightly lower than other marginal setae; total of only three pairs of marginals (fourth supernumerary pair rarely developed); disc of scutellum convex. Postalar callus with two strong setae. Postalar wall bare. Suprasquamal ridge bare. Upper calypter normal. Tegula with normal long wiry posterior setulae. Costal base not explanate (but basal costal fringe sometimes strongly developed). Abdomen with marginal hair or at most only weakly developed setae on tergite venters; T<sub>3</sub> with one pair of erect median marginal setae; intermediate tergites (T<sub>3</sub> and T<sub>4</sub>) with one or two pairs of discal setae, these sometimes feebly developed or absent in ♂. T<sub>5</sub> truncate subconical, without median depression (at most only trace of flattening at extreme apex).

**DISTRIBUTION.** Australia only, from Tasmania and South Australia to Queensland. Apparently unrepresented in Western Australia.

**DISCUSSION.** The correct nomenclature for this genus is considered below before giving any consideration to the characteristics and possible affinities.

Malloch (1927, 1929, 1936), Enderlein (1936) and Paramonov (1954, 1968) have all referred to this genus by the name *Chaetogaster*, an incorrect subsequent spelling of Macquart's name *Chetogaster* that seems to have been first published by Brauer & Bergenstamm (1891 : 418, 1893 : 228); only Townsend (1932 : 40, 1936 : 155, 1938 : 424) has used the correct original spelling. It is necessary to consider this further, as both *Chaetogaster* and *Chetogaster* spellings exist in the literature for a genus of Oligochaete Annelids. The genus *Chaetogaster* in Annelids was described by Baer (1827 : 614) and the name is valid and in current use, but Gervais (1838 : 15) cited Baer's genus as *Chetogaster* and Neave's *Nomenclator Zoologicus* lists Gervais' spelling of the name with the suffixed parenthetical comment '(pro *Chaet*-Baer 1827)'—implying that Gervais' spelling was an intentional emendation of *Chaetogaster* Baer. However, Gervais' work contains no evidence that he intentionally emended the spelling, and his use of the name *Chetogaster* is therefore an incorrect subsequent spelling under Article 33 of the *International Code of Zoological Nomenclature*; it therefore has no status in nomenclature and does not preoccupy *Chetogaster* Macquart, 1851, which name stands valid for the present genus of Tachinidae.

Enderlein (1936) erected the genus *Codium* with *Rutilia oblonga* Macquart cited as the type-species. Paramonov (1968 : 365) found that Enderlein had misidentified *oblonga* Macquart, and that the species that Enderlein called by this name is actually *Chetogaster violacea* Macquart. During the preparation of the present work I have seen the specimens from Adelaide on which Enderlein based *Codium*, and can confirm that they are *violacea* (not *oblonga*), as Paramonov said; the synonymy of *Codium* with *Chetogaster* established by Paramonov (1954) can also, therefore, be confirmed. It should be noted that the true *oblonga* Macquart also belongs to *Chetogaster*, and hence *Codium* is a synonym in any case, even if the cited nominal species is taken to be the type.

Paramonov (1954) placed *Chaetogastrina stolidia* Malloch, the type-species of *Chaetogastrina*, in the genus *Chetogaster*, thereby sinking the generic name *Chaeto*-

*gastrina* as a synonym of *Chetogaster*, and he maintained this synonymy in his later paper on the genus (Paramonov, 1968). Here it is considered that Paramonov was in error, for *stolida* shows scarcely any of the diagnostic characters of *Chetogaster* but—on the contrary—shows all the essential characters of *Paramphibolia* (q.v.); the ♂ sternite 5 and genitalia, taken with the haired suprasquamal ridge, multiple postalar setae, etc. show beyond doubt that the true affinities of *stolida* are with *assimilis* Macquart, the type-species of *Paramphibolia*, and *Chaetogastrina* is here placed as a synonym of *Paramphibolia* (see p. 100).

In his earlier paper, Paramonov (1954) placed three species in *Chetogaster* which he later (Paramonov, 1968) removed to other genera: *C. nigrithorax* (Macquart) and *C. wilsoni* Paramonov he placed in his genus *Ola* Paramonov, 1968, and *C. diversa* Paramonov he placed in his genus *Ruya* Paramonov, 1968. It is here agreed with Paramonov that *nigrithorax*, *wilsoni* and *diversa* do not belong in the genus *Chetogaster*; they are considered not to belong in the Rutiliini at all in the present definition of the tribe and are therefore omitted from further consideration.

The uncertainty over placement of these species is not surprising, for it is by no means certain that *Chetogaster* itself should really be included in the Rutiliini. Many of the characters of the genus fail to conform with those possessed by typical Rutiliines and the genus should perhaps be looked upon as annectant between the Rutiliini and the Prosenini. The narrow facial keel, robust form, haired propleuron, and number of postalar setae (two) and scutellar marginal setae (three pairs including the apicals) give the genus a facies reminiscent of the genus *Billaea* Robineau-Desvoidy from Eurasia and Africa, and *Chetogaster* seems to be an Australian counterpart to the African *Billaea*. The characters of *Chetogaster* certainly make it difficult to differentiate the Rutiliini from the Prosenini in a completely satisfactory way, but it nevertheless seems useful to maintain the two tribes in spite of the existence of some baffling forms that are hard to place in either tribe with confidence. For the present I follow the traditional placement of *Chetogaster* and retain the genus in the Rutiliini, pending better evidence on the real affinities (at the present time nothing is known of the early stages and host-relations of *Chetogaster*).

There is no practical difficulty in distinguishing *Chetogaster* from other genera within the Rutiliini as it differs from all of them by having only two setae on the postalar callus (the normal number in Tachinidae). An interesting feature of the genus, not found elsewhere in the Rutiliini, is the existence of sexual dimorphism in the palpi—those of the male being slender as in other Rutiliines, but those of the female being very conspicuously clubbed. Some *Chetogaster* species (three out of the seven currently recognized species: see key) possess a small tuft of short fine hairs on the upper part of the mediotergite just below the base of the lower calypter, and this, too, is of unusual interest: such infrasquamal setulae (as they are usually termed) occur in a number of unrelated Tachinidae, but are of very rare occurrence in the whole subfamily Proseninae and occur in no other Rutiliini.

The male genitalia and sternite 5 of *Chetogaster* species shed no light on the affinities within the Proseninae. The aedeagus is exactly similar to that of other Rutiliini (though the membranous and the sclerotized parts of the distiphallus are perhaps slightly longer than in most Rutiliines) and the surstyli and cerci show no

unusual features. Within the seven species three different shapes of surstylus occur (Text-figs 45-47) and there are slight differences in the thickness of the cerci when seen in profile: in *oblonga*, *pellucida* and *argentifera* (probably also *auriceps* of which the male is unknown at present) the surstyli are rather long and tapering and the cerci are shorter than the surstyli (Text-fig. 46); in *canberrae* the surstylus is very small in relation to the epandrium and the cerci are much longer than the surstyli (Text-fig. 45); and in *violacea* and *viridis* the surstyli are large, a little more blunt than in the *oblonga* type, and the cerci are wide in profile (Text-fig. 47). The three shapes are easily distinguished from one another, and it is perhaps questionable whether the supposed species in which the male genital conformation is identical are really distinct from one another. But on present evidence it appears best to maintain *viridis* as distinct from *violacea*, and likewise *argentifera* and *pellucida* as distinct from *oblonga*, in spite of the lack of genital differences.

Finally it may be noted here that the holotype of *C. oblonga* (Macquart) conflicts with Paramonov's (1968 : 364) placement of this species in his key: the abdomen is not 'reddish-yellow, semipellucid, with only a narrow, median black stripe' as stated in Paramonov's key, and *oblonga* holotype runs to *gratiosa* in Paramonov's key. Examination of the holotypes of *oblonga* and *gratiosa*, together with other material, indicates that the types are conspecific, and *gratiosa* is therefore placed here as a new synonym of *oblonga*.

#### INCLUDED SPECIES

- Chetogaster argentifera* Malloch. AUSTRALIA (Australian Capital Territory, New South Wales, Victoria). [Holotype examined].  
*C. auriceps* Paramonov. AUSTRALIA (Queensland).  
*C. canberrae* Paramonov. AUSTRALIA (Victoria to Queensland). [Holotype examined].  
*C. oblonga* (Macquart). AUSTRALIA (New South Wales, Victoria). [Holotype examined].  
*gratiosa* Paramonov **syn. n.** [Holotype examined].  
*C. pellucida* Paramonov. AUSTRALIA (New South Wales). [Holotype examined].  
*C. violacea* Macquart. AUSTRALIA (Tasmania to Queensland). [Holotype examined].  
*C. viridis* Malloch. AUSTRALIA (New South Wales, Queensland). [Holotype examined].

#### KEY TO SPECIES OF THE GENUS CHETOGASTER

- 1 Calyptrae bright orange-yellow. Wings conspicuously yellow or yellow-orange anterobasally (as all basal veins with this colour) and faintly but distinctly tinged with yellowish or smoky brownish colour elsewhere. Infrascapular setulae present.<sup>3</sup> ♂ surstyli and cerci in profile as in Text-fig. 47 (cercus rather broad and sharply narrowing at tip). Large species, length normally 16-20 mm. . . . . 2

<sup>3</sup> The infrascapular setulae consist of a small tuft of hairs immediately below the base of the lower calypter on the mediotergite. They are very small and careful examination is required.

- Calyptrae not yellow, either white or partly to completely smoky brown. Wings entirely clear hyaline with dark veins. Infrascapular setulae absent (except in *canberrae*). ♂ surstyli and cerci not of this shape, cerci more slender (Text-figs 45 & 46). Smaller species, length normally 10-16 mm . . . . . 3
  - 2 Abdomen metallic green to blue-violet on dorsum and violaceous on venter; abdominal venter with scarcely any trace of whitish pollinosity visible to naked eye in any light. Mesonotum dark green to blue-green with the pollinosity distinctly tinged with yellow. Scutellum green to violet. ♂ vertex 0.12-0.14 of head-width. Abdominal T<sub>5</sub> with unusually strong, often distinctly spiniform, bristling *C. viridis*
  - Abdomen bluish black with purplish tinge dorsally and deep violet or reddish violet ventrally; venter with white pollinosity extremely conspicuous to naked eye when abdomen viewed from behind. Mesonotum very dark blue-black or violaceous black with the pollinosity white. Scutellum dark violet (sometimes with brownish tinge) to purplish black. ♂ vertex consistently wider, 0.15-0.17 of head-width. Abdominal T<sub>5</sub> with strong bristling but the setae long and not at all spiniform *C. violacea*
  - 3 Palpi and epistome black or brownish black. Upper and lower calypter both dark smoky brown. Infrascapular setulae present (but minute and inconspicuous). ♂ genitalia with surstylus shaped as in Text-fig. 45, cerci much longer than the relatively small surstyli . . . . . *C. canberrae*
  - Palpi and epistome yellow or tawny yellow. Calyptrae white or mainly white, if largely smoky brown then at least basal half of upper calypter white. Infrascapular setulae absent. ♂ genitalia with surstylus shaped as in Text-fig. 46, cerci shorter than surstyli . . . . . 4
  - 4 Ground colour of abdomen tawny yellowish or very pale reddish brown with a conspicuous black median vitta (abdomen distinctly pallid to naked eye on either side of the black mid-line). Scutellum dark brown with little or no trace of metallic colour . . . . . *C. pellucida*
  - Ground colour of abdomen very dark metallic greenish or violaceous, appearing dark brownish in some lights only, darkest mid dorsally but without a definite black vitta. Scutellum distinctly metallic steely blue-black or purplish violet . . . . . 5
  - 5 Third antennal segment uniformly bright orange. Parafrontals bright yellow pollinose. Ground colour of parafrontals tawny reddish. Calyptrae almost all white, only the border darkened. Abdomen with pollinosity of the dorsum almost entirely whitish (at most only yellowish brown near the mid-line)
- C. argentifera, C. auriceps*
- [*C. auriceps* is known only from the ♀ holotype which has not been examined. Paramonov (1968) distinguished it from *argentifera* mainly by the yellow pollinose, instead of silvery whitish pollinose, parafrontals. It appears doubtful whether *auriceps* is specifically distinct from *argentifera*.]
- Third antennal segment partly or mainly brown, at least infusate along one edge. Parafrontals mainly whitish pollinose (if lower parts somewhat yellowish pollinose as in some ♀ specimens then calyptrae largely smoky brown). Ground colour of parafrontals blackish. Calyptrae at least faintly infusate over much of their surface or lower calypter broadly darkened against hind edge, calyptrae of ♀ usually dark smoky brown except for basal half of upper calypter. Abdomen with pollinosity of the dorsum mainly dark yellowish brown or coppery brown on the median third (the darker pollinosity of the middle of the abdomen contrasting with the whitish lateral pollinosity in some lights) . . . . . *C. oblonga*

## LECTOTYPE DESIGNATIONS

Lectotypes are newly designated in this section for the 29 species-group taxa of Rutiliini which were originally based upon syntypes and for which no previous valid

lectotype designations or restrictions have been published; the lectotypes have been appropriately labelled. The names are listed in alphabetical order under their original generic assignments.

For some taxa not all of the original syntypes have been located and examined, but all available syntypes other than the lectotypes (i.e. the paralectotypes) are noted in the following list and have been labelled as paralectotypes.

It should be noted that several of Enderlein's types have labels in his handwriting on which the generic name is different from that with which the specific name was combined in publication, and attention has been drawn to such discrepancies where they occur by quoting the labels. Enderlein (1936) evidently discovered, while his paper was in press, that his genus *Habrota* was based upon the same type-species as *Chrysorutilia* Townsend, 1915, and that some of his new species should be assigned to Townsend's genus; thus these were published in *Chrysorutilia* but remained labelled as *Habrota*; but, apart from this, there are instances where Enderlein seems simply to have changed his mind on the generic position of some new species between the time of labelling the types and publishing the paper. However, despite these discrepancies between label name and published name, there is never any doubt about the identity of the types for any nominal species-group taxon.

***Chrysorutilia angustigena* Enderlein, 1936 : 403.**

Described from two ♂ syntypes from the same type-locality. LECTOTYPE ♂. AUSTRALIA, Queensland, Herberton, i.1910 (*J. P. Dodd*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Habrota angustigena Type Enderl. ♂'.

***Chrysorutilia caeruleata* Enderlein, 1936 : 402.**

Described from ♂ and ♀ syntypes (total number not clearly stated) from the same type-locality on different dates. LECTOTYPE ♂. AUSTRALIA, Western Australia, Marloo Station, ix.1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotypes: 2 ♂, 1 ♀, same data as lectotype except dates ix. 1934 for one ♂ and ii.1935 for ♀ (♂♀ in MNHU, Berlin; ♂ with date ix.1934 in BMNH, London).

The lectotype bears Enderlein's name label 'Habrota caeruleata Type Enderl. ♂', and the paralectotypes cited also bear Enderlein labels with the 'Habrota' generic name. The ♀ paralectotype is probably mis-associated with the lectotype.

***Chrysorutilia caesia* Enderlein, 1936 : 402.**

Described from one ♂ and one ♀ syntypes from 'Australien' and four ♀ syntypes from Queensland, of which the ♂ is designated. LECTOTYPE ♂. AUSTRALIA (*Clement*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype (MNHU, Berlin).

Enderlein's name label is lost from the lectotype specimen (though its identity as the original ♂ syntype is certain from the label 'Australien Clement' and agreement with description), but the paralectotype ♀ has Enderlein's name label 'Rutilia caesia Type Enderl. ♀'.

***Chrysorutilia goerlingiana* Enderlein, 1936 : 404.**

Described from two ♀ syntypes from the same type-locality. LECTOTYPE ♀. AUSTRALIA, Western Australia, Wurarga, Marloo Station, i.1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Rutilia goerlingiana Type Enderl. ♀'.

***Chrysorutilia lineata* Enderlein, 1936 : 407.**

Described from one ♂ and one ♀ syntypes from the same locality. LECTOTYPE ♂. AUSTRALIA, Western Australia, Wurarga, Marloo Station (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Habrota lineata Type Enderl. ♂'.

***Chrysorutilia rufibarbis* Enderlein, 1936 : 405.**

Described from one ♀ syntype from 'Nord-Australien', and one ♂ and one ♀ syntypes from Western Australia, of which the ♂ is here designated. LECTOTYPE ♂. AUSTRALIA, Western Australia, Wurarga, Marloo Station, ix-x.1934 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype except date x-xi.1934 (MNHU, Berlin).

The lectotype bears Enderlein's name label 'Habrota rufibarbis Type Enderl. ♂' and the year date is 1934 (not 1935 as Enderlein cited). The paralectotype ♀ (which is much larger than, and perhaps not conspecific with, the lectotype) also has 'Habrota' on Enderlein's name label.

***Chrysorutilia splendida* var. *confluens* Enderlein, 1936 : 407.**

Described from one ♀ syntype from Western Australia, one ♀ syntype from Sydney, and a ♂ and five ♀ syntypes from Queensland. LECTOTYPE ♂. AUSTRALIA, Queensland (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, AUSTRALIA, Western Australia, Swan River (*Dämel*) (MNHU, Berlin).

The lectotype bears Enderlein's name label 'Habrota splendida (Donov. 1805) var. confluens Type Enderl. ♂'. The ♀ paralectotype (which has pale pleural hair and is probably wrongly associated) is labelled 'Rutilia splendida Guér. var. confluens Type Enderl. ♀'.

***Dexia zabirna* Walker, 1849 : 863.**

Described from two ♂ syntypes with identical data from the British Museum collection, each of which bears an old accession label reading '47 109' on one side and 'W. Austr-alia' on the other, and a pencilled locality label in Austen's handwriting. LECTOTYPE ♂. AUSTRALIA, Western Australia, Perth (*G. Clifton*) (in British Museum (Natural History), London). Paralectotype: one ♂, same data as lectotype (BMNH, London).

***Donovanius fulgidus* var. *nigrbasis* Enderlein, 1936 : 411.**

Described from an unstated number of ♂ and ♀ syntypes from the same locality. LECTOTYPE ♂. AUSTRALIA, Western Australia, Wurarga, Marloo Station, 6.vi.1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype except date ix.1935 (MNHU, Berlin).

***Idania ralumensis* Enderlein, 1936 : 409.**

Described from two ♀ syntypes with the same data. LECTOTYPE ♀. PAPUA NEW GUINEA, New Britain, Ralum, 30.viii.1896 (*F. Dahl*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Rutilia ralumensis Type Enderl. ♀'.

***Laccura engeli* Enderlein, 1936 : 431.**

Described from two ♀ syntypes with the same data. LECTOTYPE ♀. INDONESIA, Banda Islands, Run [=Roon] Island (south of Ceram) (in Museum für Naturkunde der Humboldt-Universität, Berlin).

***Pancala eos* Enderlein, 1936 : 423.**

Described from three ♂ and seven ♀ syntypes from Celebes. LECTOTYPE ♂. INDONESIA, Celebes, Bonthain, Wawa Karaeng, 1100 m, viii.1931 (*G. Heinrich*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotypes: one ♂, two ♀, same data as lectotype (♂ in BMNH, ♀♀ in MNHU); one ♀, same data as lectotype except date ix-x.1931 (MNHU).

***Pancala gemmata* Enderlein, 1936 : 424.**

Described from one ♀ and two ♂ syntypes from New Britain. LECTOTYPE ♂. PAPUA NEW GUINEA, New Britain, Ralum, Karakaul, 30.viii.1896 (*F. Dahl*) (in Museum für Natur-

kunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Chromocharis gemmata Type Enderl. ♂'.

***Pancala gemmata* var. *viridescens*** Enderlein, 1936 : 424.

Described from two ♂ syntypes with the same data. LECTOTYPE ♂. PAPUA NEW GUINEA, New Britain, Kinigunang (*C. Ribbe*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Pancala gemmata n. sp. var viridescens Type Enderl. ♂'.

***Prosenostoma nigripes*** Enderlein, 1936 : 435.

Described from two ♂ syntypes from Queensland, one from Cairns and the other from Herberton. LECTOTYPE ♂. AUSTRALIA, Queensland, Herberton, 3700 ft, ii.1911 (*Dodd*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). The lectotype bears Enderlein's name label 'Agalmia nigripes Type Enderl. ♂'.

***Psaronia bisetosa*** Enderlein, 1936 : 414.

Described from two ♀ syntypes from Western Australia. LECTOTYPE ♀. AUSTRALIA, Western Australia, Wurarga, Marloo Station, 1935 (*A. Goerling*) (in Museum für Naturkunde der Humboldt-Universität, Berlin).

***Pseudoformosia pauper*** de Meijere, 1904 : 178.

Described from three ♂ syntypes collected by Bernstein in northern Halmahera. LECTOTYPE ♂. INDONESIA, Moluccas, N. Halmahera (*Bernstein*) (in Rijksmuseum van Natuurlijke Historie, Leiden). Paralectotype: one ♂, same data as lectotype (in British Museum (Natural History), London).

The syntypes cited above each bear a printed label reading 'Bernstein Noord Halmaheira'. The Leiden Museum collection contains, standing with the lectotype, two ♂ specimens each with a similar printed label reading 'Bernstein Morotai' but these specimens have no type-status. Similarly, the collection of the Zoölogisch Museum, Amsterdam, contains one ♂ and one ♀ specimen of *pauper* with the printed 'Bernstein Morotai' labels, but these specimens also have no type-status.

***Rutilia atribasis*** Walker, 1861b : 288.

The type-material consists of two conspecific ♀ syntypes, though the number of specimens was not stated by Walker. LECTOTYPE ♀. INDONESIA, Moluccas, Batjan [publ. as 'Batchian'] (*A. R. Wallace*) (in British Museum (Natural History), London). Paralectotype: one ♀, same data as lectotype (in University Museum, Oxford).

***Rutilia desvoidyi*** Guérin-Ménéville, 1843 : 269.

Described from three syntypes (two ♂, one ♀) from 'Nouvelle-Hollande', of which the males have not been located and are presumed lost and of which the ♀ syntype (here designated) is in Paris. LECTOTYPE ♀. AUSTRALIA (no other data) (in Muséum National d'Histoire Naturelle, Paris, standing in Macquart collection under reference number 2310).

The lectotype bears a label in Guérin-Ménéville's writing which reads 'Rutilia Desvoidyi. guer. R. vivipara. Rob. D. p. 321.3. non vivipara f. N.elle hollande', this label making reference to the fact that Guérin-Ménéville considered that *Rutilia vivipara* of Robineau-Desvoidy was a misidentification of the true *R. vivipara* (Fabricius). There is no known evidence to support Guérin-Ménéville's supposition, and as the lectotype of *desvoidyi* is conspecific with the neotype of *Rutilia vivipara* (Fabricius) (herein designated) the name *desvoidyi* falls as a synonym of *vivipara*.

***Rutilia inornata*** Guérin-Ménéville, 1843 : 268.

Described from five ♀ syntypes from 'Nouvelle-Hollande' recorded in the original description as '5 individus femelles provenant du même marchand, 2 dans la coll. du Muséum, 3 dans la mienne'; the museum referred to is the Natural History Museum in Paris. The two syntypes in Paris Museum still exist there as part of the Macquart collection, but the other three syntypes

have not been located and are presumed lost. LECTOTYPE ♀. AUSTRALIA (no other data) (in Muséum National d'Histoire Naturelle, Paris, standing in Macquart collection under reference number 2311). Paralectotype: one ♀, same data as lectotype (MNHN).

Both lectotype and paralectotype are in bad condition, the latter consisting only of the thoracic shell and right wing; the lectotype is eaten out in places, lacks antennae and mouthparts and has been glued in places. The lectotype bears a label in Guérin-Méneville's writing which reads 'Rutulia inornata. guer. ic. R. a. (type) Nelle holl.'

***Rutulia lucigena* Walker, 1861a : 242.**

Described from both sexes but number of specimens not stated, though actually consisting of three conspecific syntypes. LECTOTYPE ♂. INDONESIAN NEW GUINEA, Dorey (A. R. Wallace) (in British Museum (Natural History), London). Paralectotypes: one ♂, one ♀, same data as lectotype (BMNH).

***Rutulia pretiosa* Snellen van Vollenhoven, 1863 : 15.**

Described from one ♂ and one ♀ syntype, both still in Leiden Museum. LECTOTYPE ♂. INDONESIA, Moluccas, Ternate (Bernstein) (in Rijksmuseum van Natuurlijke Historie, Leiden). Paralectotype: one ♂, same data as lectotype except collector Forsten (also in RMNH, Leiden).

The lectotype bears a circular white label with the words 'Bernst. Ternate' in ink, and the paralectotype bears a similar label with the words 'Forsten Ternate'.

***Rutulia pubicollis* Thomson, 1869 : 530.**

Described from an unstated number of ♂ specimens from 'Sidney'; the type-material actually consists of two identically labelled and set syntypes in Stockholm. LECTOTYPE ♂. AUSTRALIA, New South Wales, Sydney (Kinb.) (in Naturhistoriska Riksmuseum, Stockholm). Paralectotype: one ♂, same data as lectotype (NR, Stockholm).

Each of the two syntypes has a small rectangular printed label reading 'Sidney' and another rectangular printed label reading 'Kinb.'

***Rutulia saturatissima* Walker, 1861b : 287.**

Described from both sexes without statement of the number of specimens. Type-material consists of one syntype of each sex (conspecific). LECTOTYPE ♂. INDONESIA, Moluccas, Batjan [publ. as 'Batchian'] (A. R. Wallace) (in British Museum (Natural History), London). Paralectotype: one ♀, same data as lectotype (BMNH).

***Rutulia speciosa* Erichson, 1842 : 273.**

Erichson did not state the sex of the original material or the number of specimens, but Enderlein (1936 : 430) showed that there were three ♀ syntypes collected by Schayer in Tasmania which he referred to as 'die Typen Erichson's'. Two of these syntypes have been seen. LECTOTYPE ♀. AUSTRALIA, Tasmania (Schayer) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype (MNHU, Berlin).

The lectotype bears two rectangular blue labels with the handwritten words 'Vandiem. Schayer' and 'Speciosa Er.' respectively (these probably both in Erichson's hand), and also a yellow rectangular label with the printed number '3554'. The paralectotype bears a label reading 'Tasmanien Schayer' in Enderlein's writing. The third syntype has not been seen but is probably still in the MNHU, Berlin, collection.

***Rutulia spinipectus* Thomson, 1869 : 530.**

Described from an unstated number of specimens of both sexes from 'Sidney'; the type-material consists of one ♂ and one ♀ syntype. LECTOTYPE ♂. AUSTRALIA, New South Wales, Sydney (Kinb.) (in Naturhistoriska Riksmuseum, Stockholm). Paralectotype: one ♀, same data as lectotype (NR, Stockholm).

Each of the syntypes has a small rectangular printed label reading 'Sidney' and another rectangular printed label reading 'Kinb.'

***Rutulia volucelloides* Walker, 1861b : 289.**

Walker described this species from both sexes, but only a single syntype now exists; this is

here designated as lectotype. LECTOTYPE ♂. INDONESIA, Moluccas, Batjan [publ. as 'Batchian'] (*A. R. Wallace*) (in British Museum (Natural History), London).

***Senostoma flavipes*** Brauer & Bergenstamm, 1889 : 126 (58).

Brauer & Bergenstamm described both the ♂ and the ♀ of this species, and the original material consisted therefore of at least two syntypes; the locality was cited as 'Neuholland'. Engel (1925 : 375) saw the original material and referred to it as '♂ and ♀ Neu Holland (Typen No. 38 u. 39)', clearly indicating that the syntypes consisted of one of each sex. The ♂ syntype cannot now be found in the Vienna Museum collection, but the ♀ syntype is still present there: it is here designated as lectotype. LECTOTYPE ♀. ['NEW HOLLAND'] (in Naturhistorisches Museum, Vienna).

The lectotype has a square white label inscribed in slightly faded ink 'Dup. n 39', the number 39 conforming with the number cited for the ♀ syntype by Engel.

Townsend (1932, 1938) misunderstood the type-material of *flavipes* and the specimens from Western Australia cited by him as 'Holotype', and in his notes in the U.S. National Museum, Washington, as 'Holotype' and 'Paratype' have no type-status (see further discussion of this in the treatment of the subgenus *Microrutilia*).

Direct comparison of the lectotype ♀ of *flavipes* Brauer & Bergenstamm with the lectotype ♀ of *fulviventr* Bigot shows that the types are in perfect agreement and unquestionably conspecific. Hence the name *flavipes* is sunk as a new synonym of *fulviventr* (see p. 90).

***Tachina inusta*** Wiedemann, 1830 : 306.

Described from an unstated number of specimens of unstated sex from 'Port Jackson in Neuholland' (i.e. Sydney), and recorded by Wiedemann as in the Berlin Museum. Enderlein (1936 : 412) found four ♀ specimens collected by Eschscholtz at Port Jackson which he recorded as 'Typen Wiedemann's', of which two have been examined and one here designated as lectotype. LECTOTYPE ♀. AUSTRALIA, New South Wales, Sydney [publ. as 'Port Jackson'] (*Eschscholtz*) (in Museum für Naturkunde der Humboldt-Universität, Berlin). Paralectotype: one ♀, same data as lectotype (MNHU, Berlin).

The lectotype bears a rectangular faded bluish-grey label with the words 'P. Jackson. Esch.', and another faded bluish grey label reading 'inusta Tachin. inusta Wied.', the writing on both labels probably being Wiedemann's (as it closely resembles the writing on Wiedemann's type labels in Copenhagen); in addition the lectotype has a printed label '3553'. The paralectotype is labelled 'Australien Port Jackson Eschscholtz' in Enderlein's writing.

#### NEOTYPE DESIGNATIONS

The types of some of the Rutiliini described by the early workers (i.e. before 1850) are lost and have never been reported in the literature as having been seen by anyone since the time of description. The type-material is considered to be certainly lost in the case of fifteen nominal species described by Donovan, Fabricius, Guérin-Ménéville, Macquart, Robineau-Desvoidy and Walker. Most of the names involved apply to, or are believed on all available evidence to apply to, distinct species and to be taxonomically valid; several of them have been in use for many years, but have not always been applied to the same species. Some of the supposedly single species to which some of these old names have been applied are now known to be complexes of very closely allied species, and to disentangle past confusion (as well as to obviate the possibility of future misidentifications) it is considered highly desirable to establish neotypes so that the meanings of the names can be fixed.

Opinions vary among taxonomists on the desirability of neotypes: some workers maintain that they are scarcely, if ever, justified and others regard them as desirable for every case where there is no surviving original type-material. I take an inter-

mediate viewpoint and regard them as desirable in groups that have been much confused with diverse applications of the same names (with a high potential for continuing future confusion), but only for names that are maintained as valid or are unfamiliar synonyms for which there is good reason to have neotypes. In the present work, neotypes are established for twelve of the fifteen names for which original type-material no longer exists; the other three names (*australasia* Gray, *fulvipes* Guérin-Méneville, and *vidua* Guérin-Méneville) have been accepted for many years as junior synonyms, there are no reasons for doubting the rightness of the synonymies, and neotypes are not therefore established for these names.

Special care has been taken here to ensure that the neotypes proposed are validly designated according to the rather stringent terms of Article 75 of the *International Code of Zoological Nomenclature* (1961). The present paper contains the results of revisory work based upon a study of the whole tribe Rutiliini, during which it has been found necessary for neotypes to be established in the interests of stability of nomenclature, by resolving confused and doubtful identities (Article 75 (a) (i)). For each neotype it is considered that the qualifying conditions specified in Article 75 (c) (1-6) are fully satisfied in the present work for the following reasons (in order of the six qualifying conditions): (1) The placement of the species for which the neotype stands in a key to all the species of its higher taxon, together with a figure of the male genitalia and a bibliographic reference to the original description, constitute a statement of the characters which (in my view) differentiate the species for which the neotype is designated; (2) The data is published here for each neotype and each has been appropriately labelled; (3) Original material has been personally searched for in all likely museum collections, none has been found and none has been mentioned by any author since the time of description, from which facts it is concluded that all original type-material of each nominal species for which a neotype is designated is either lost or destroyed; (4) The characters of each neotype are completely consistent with the original description, except that a male specimen has usually been chosen as neotype (for the male has better characters than the female) even though the original description or figure was based or apparently based on a female specimen; (5) The exact provenance of the original material is usually uncertain, in which case the neotype specimen is chosen from an area which is considered a likely or possible original provenance having regard to all the circumstances of the time when the species was described (e.g. early coastal development of Australia); (6) The museum depository is named for each neotype (the neotypes are deposited either in the Australian National Insect Collection at Canberra or in the British Museum (Natural History) in London, which maintain research collections and make types available for study).

The twelve neotypes designated are all for nominal species belonging in the genus *Rutilia* Robineau-Desvoidy s.l.; ten of them (viz. *chersipho*, *decora*, *formosa*, *imperialis*, *lepida*, *pellucens*, *regalis*, *setosa*, *splendida* and *vivipara*) apply to nominal species of which the names are considered taxonomically valid in the present work, and the other two (*durvillei* and *serena*) apply to newly established synonyms. The twelve nominal species belong in three subgenera of *Rutilia* and their neotypes therefore show the subgeneric characteristics which define the subgenera (see subgeneric

diagnoses): *chersipho*, *decora*, *formosa*, *imperialis* and *splendida* belong in the subgenus *Chrysorutilia* Townsend; *lepida*, *pellucens* and *regalis* in the subgenus *Donovanius*; and *setosa* and *vivipara* in *Rutilia* s.str.; *serena* is considered to be a synonym of *rubriceps*, a species of *Chrysorutilia*, and *durvillei* is a synonym of *vivipara* (the type-species of *Rutilia*).

The names of the nominal species for which neotypes are designated in the following list are arranged in alphabetical order of their original binomina; data and depository of each neotype are cited first, followed by any appropriate annotation.

***Dexia chersipho*** Walker, 1849 : 864.

NEOTYPE ♂. AUSTRALIA, Western Australia, Waroona, 21.xi.1908 (*G. F. Berthoud*) (in British Museum (Natural History), London).

This species was described from a specimen of unknown locality in Children's collection. The specimen is not among those in the BMNH from Children's collection, has never been located and appears certainly lost. Walker's description of the very distinctive colour pattern and his placement in the *Rutilia* group of *Dexia* fit perfectly the common Western Australian species later called *erichsonii* Engel, 1925, and there is considered to be no doubt about the identity of *chersipho*: it is an older name for *erichsonii*, which is herein placed in new synonymy with *chersipho*.

***Dexia serena*** Walker, 1849 : 865.

NEOTYPE ♀. INDIA, Maharashtra, Purandhar, near Poona, c. 3000 ft, on bush (*E. P. Sewell*) (in British Museum (Natural History), London).

Described from a female specimen from Madras presented to BMNH by Walter Elliott but now lost. The description clearly indicates that this is the only species of *Chrysorutilia* so far described from India, and fits exactly with the holotype female of *Rutilia nitens* Macquart, 1851, from India. Enderlein (1936 : 403) placed *nitens* as a synonym of *serena* and this synonymy is here upheld, the primary types being undoubtedly conspecific. In the present revisionary work, however, no differences have been found between the Indian material and *Rutilia rubriceps* Macquart from Australia, so that both *serena* and *nitens* are herein treated as new synonyms of *rubriceps*.

***Musca splendida*** Donovan, 1805 : plate figure, unpaginated description.

NEOTYPE ♂. AUSTRALIA, Queensland, Brisbane, 8.xi.1907 (*A. J. C. Wightman*) (in British Museum Natural History), London).

Townsend's (1932 : 39; 1938 : 416) statement of 'Ht [=holotype] in London' for *splendida* is based on the mere supposition that Donovan's type must be in the British Museum (Natural History). In fact there is no such specimen in BMNH collection, and no original material has ever been located. Donovan's figure was based on a specimen from McLeay's cabinet from New South Wales, but the specimen has not been found in the McLeay Museum, Sydney. Donovan's coloured plate of *splendida* shows, at natural size, a large metallic blue-green *Rutilia* species with yellow head and metallic spots on the abdomen, clearly a species of *Chrysorutilia*. The name *splendida* as used in the literature refers to a complex of three species characterized by three quite distinct forms of male genitalia, one of which was figured by Malloch (1929 : 296) under the name *splendida*. As the species figured by Malloch is apparently the commonest of the three, occurring widely in New South Wales and Queensland (and therefore the most likely to have been seen by Donovan), it is from this species that the neotype has been designated and to which the name *splendida* is therefore restricted.

Malloch (1928c : 660) and Townsend (1938 : 416) cited the publication date of *splendida* as 1798 in error. The correct date is 1805, as cited by Enderlein (1936 : 407).

***Rutilia decora*** Guérin-Méneville, 1843 : 266.

NEOTYPE ♂. AUSTRALIA, Queensland, Burpengary (T. L. Bancroft) (in British Museum (Natural History), London).

This species was described from a single female from 'Nouvelle-Hollande'. The holotype is lost, and Townsend's (1932 : 38) statement of a female holotype in Paris is in error: there are no specimens remaining in Paris of *decora* among Guérin-Méneville's material (which is scattered in Macquart's collection), but there are specimens standing in Macquart's collection under the name *decora* which are later determined material. The description of *decora* is very full and detailed and certainly applies to a species of the *splendida*-complex of *Chrysorutilia*, and Malloch (1928c : 660), Townsend (1932 : 38-39) and Enderlein (1936 : 407) treated *decora* as a synonym of *splendida* (though Enderlein accorded it varietal status). In the present revision it is considered best to apply the name to a species which is very closely allied to *splendida* but has distinctly different male genitalia (see key and Text-figures); this recovers the name *decora* from synonymy and obviates the need to add a new name to the literature. It is considered far better to bring the old name *decora* into use for a valid species (which exactly fits the original description) than to describe a new species unnecessarily.

***Rutilia durvillei*** Robineau-Desvoidy, 1830 : 321.

NEOTYPE ♂. AUSTRALIA, New South Wales, Hawkesbury River, 28.xi.1914 (in British Museum (Natural History), London).

Robineau-Desvoidy described this nominal species from a male specimen collected at Port Jackson (i.e. Sydney harbour) by Captain Dumont-Durville and given to him by Guérin-Méneville. The neotype specimen is from the Hawkesbury River, which enters the sea just north of Port Jackson. Robineau-Desvoidy's description refers to a specimen closely resembling *vivipara* Fabricius and having a bluish trace on the thoracic dorsum and a series of stiff bristles on each abdominal segment ('une série de poils raides et noirs au sommet de chaque segment'). This description makes it clear that the type had conspicuous bristling on the third abdominal tergite (apparent second segment) as well as on the other segments, and from this statement (plus the remainder of the description) it seems certain that the name *durvillei* alluded to a species of the subgenus *Rutilia* s. str. In this subgenus only *vivipara* (the type-species) has the abdominal bristling as bold and conspicuous as Robineau-Desvoidy's description implies, and I believe it to be almost certain that the *durvillei* type was a specimen of *vivipara* (some specimens of the latter have a slight bluish or purplish tinge on the scutum). I have therefore designated as neotype of *durvillei* a male specimen of *vivipara* (a specimen considered unquestionably conspecific with the neotype of *vivipara* herein designated also); the name *durvillei* is therefore disposed of in synonymy with *vivipara*, which is a better course than bringing the name into use on shaky evidence for some valid species.

***Rutilia formosa*** Robineau-Desvoidy, 1830 : 320 (name attributed to 'Donavan' in error).

NEOTYPE ♂. AUSTRALIA, New South Wales, near Lake George, 25.xi.1953 (S. J. Paramonov) (in Australian National Insect Collection, Canberra).

Robineau-Desvoidy described this species from a specimen of unstated sex that stood in Count Dejean's collection from 'Nouvelle-Hollande'. Under his name *Rutilia formosa*, Robineau-Desvoidy attributed the name to Donovan with the statement '*Musca formosa*, Donovan' and after the description wrote 'Donovan l'a décrite et figurée parmi les insectes remarquables de ce pays' (i.e. Australia). It appears that Robineau-Desvoidy wrote '*formosa*' in error, as Donovan described and figured only one species of Rutiliine, namely *Musca splendida*; there is no such nominal species as *formosa* Donovan. Although Robineau-Desvoidy's description may have been intended as a redescription of *splendida* Donovan there is no conclusive evidence of this, and (in common with other workers on the group) I therefore accept *Rutilia formosa* Robineau-Desvoidy as a nominal species originally based upon a type-specimen. This type-specimen, along with all the other Diptera from Count Dejean's collection, is now lost and there are no specimens in Robineau-Desvoidy's collection or any other authoritatively identified specimens by which the identity of *formosa* R.-D. can be determined. Robineau-Desvoidy's

description, however, is clearly that of a species of the subgeneric concept *Chrysorutilia* and contains certain clues on which species he must have had before him. Most of the *Chrysorutilia* species from Australia have brilliant yellow heads, but the head of *formosa* is described as having a red interfrontal area ('Frontaux rouges') and the remainder mainly whitish ('côtes du front et face blanchâtres'); the lower part of the face is described as bluish, which appears to suggest that the epistome is rather metallic. One species that is common in eastern Australia fits this description very well, as it has the parafrontals and parafacials whitish pollinose (therefore contrasting with the red interfrontal area) and often shows distinct metallic colour on the epistome, and it is therefore from this species that the neotype specimen has been designated for *formosa* R.-D. Other characters of the species, including the male genital characters, are indicated in the accompanying key and text-figure.

It should be noted that Robineau-Desvoidy's description does not fit *splendida* (which is a species with brilliant yellow head), so that even if his use of *formosa* and attribution to Donovan were a lapsus for *splendida* it is clear that he did not have the true *splendida* before him. Townsend (1938 : 413) cited a '*Musca formosa* [Donovan] (1805)' but there is no such nominal species in the works of Donovan; he also stated that *formosa* R.-D. is a synonym of *retusa* Fabricius, but the holotype of the latter still exists and has been examined and found to be completely distinct from any of the species of *Chrysorutilia* (belonging in fact in the subgenus *Donovanius*). Townsend's (1915) genus *Chrysorutilia* rests nomenclaturally upon the statement 'Genotype, *Rutilia formosa* Desvoidy, 1830, Essai Myodaires, 320' without any account of the characters defining the taxon; since no characters are cited in this original 'description' it is here presumed that no conflict exists between Townsend's original meaning of *Chrysorutilia* and the meaning given to it in the present work by designation of a neotype for *formosa* R.-D., the type-species. It should be recorded, though, that Townsend's (1938) later meaning of *Chrysorutilia* (after he had synonymized *formosa* with *retusa* without any confirmatory evidence) is different and his definition in *Manual of Myiology* seems to apply better to the concept *Donovanius* Enderlein, here regarded as a valid subgenus. There were no specimens cited by Townsend in the original (1915) proposal of *Chrysorutilia*, and I hold therefore that Enderlein's (1936 : 401-408) interpretation of *Chrysorutilia* Townsend, which is in conformity with the present interpretation based upon neotype designation for the cited type-species, is taxonomically correct—even if specimens later held to be *formosa* by Townsend belong to another concept. (It would not be a case of misidentified type-species because no specimens were cited in the original description by which Townsend's meaning of *formosa* was established; the type-species of *Chrysorutilia* must therefore be the nominal species named by Townsend as type-species, i.e. the *formosa* R.-D. whose characters are now pinned down by neotype designation.)

***Rutilia imperialis* Guérin-Méneville, 1843 : 265.**

NEOTYPE ♂. AUSTRALIA, New South Wales, Mt Wilson, 2.i.1953 (*M. F. Day*) (in Australian National Insect Collection, Canberra).

This species was described from a male and a female from 'Nouvelle-Hollande' without further data. It occurs mainly in south-eastern Australia (New South Wales and Victoria) and as much of the early collecting was done in New South Wales the neotype specimen designated is from that state.

***Rutilia lepida* Guérin-Méneville, 1843 : 268.**

NEOTYPE ♂. AUSTRALIA, Australian Capital Territory, Blundell's, near Canberra, 19.iv.1948 (*Paramonov*) (in Australian National Insect Collection, Canberra).

This species was described from a specimen from 'Nouvelle-Hollande' without further data. The careful description of Guérin-Méneville leaves really no doubt that his name *lepida* applies to the species later described by Macquart as *Rutilia fulgida*. The latter name has not been in use for any species of *Rutilia* (and was never, for instance, mentioned by Malloch in his various papers on Rutiliini), and no disruption of nomenclature arises from fixing the specimen here cited as neotype of *lepida* and sinking Macquart's name *fulgida* in new synonymy (see p. 73). The lectotype of *fulgida* Macquart (designated by Crosskey, 1971) is in the British Museum

(Natural History), and has been directly compared with the specimen chosen as neotype of *lepida*; the two primary types are undoubtedly conspecific. *Rutilia lepida* occurs in south-eastern Australia from northern New South Wales to Victoria, and the neotype chosen (from near Canberra) is from a fairly central position in the normal range.

***Rutilia pellucens* Macquart, 1846 : 305 (177).**

NEOTYPE ♂. AUSTRALIA, New South Wales, Durras Bay, 15-30.x.1953 (F. M. Hull) (in British Museum (Natural History), London).

This species was described from a single specimen (holotype) that stood in Fairmaire's collection. Crosskey (1971) considered the type lost, as no Diptera from Fairmaire's collection have been located; however, the identity of *pellucens* is clear from the five specimens of the species in the British Museum (Natural History) collection that were identified by Macquart himself. The existence of several species of *Rutilia* which are extremely similar to *pellucens* and easily confused with it, makes neotype fixation desirable: as there is no data on the specimens identified by Macquart, other than that they came from Australia, a recently collected specimen with full data has been chosen as neotype after direct comparison with the specimens seen by Macquart.

***Rutilia regalis* Guérin-Ménéville, 1831 : plate 21, fig 1.**

NEOTYPE ♂. AUSTRALIA, Australian Capital Territory, Tharwa, 14.ii.1951 (S. J. Paramonov) (in Australian National Insect Collection, Canberra).

Guérin-Ménéville's excellent coloured plate of this species (published in 1831, earlier than the text description 1838) shows a large rather uniformly green *Rutilia*, and has enabled later workers to recognize *regalis* correctly. Specimens of *R. regalis* vary slightly in the intensity and shade of green colouring; the original plate figure shows a specimen that is rather golden-green, and the specimen chosen as neotype has a slight golden tinge. The range of the species is mainly from New South Wales to South Australia.

***Rutilia setosa* Macquart, 1847 : 94 (78)**

NEOTYPE ♂. AUSTRALIA, New South Wales, 4 miles North of Bateman's Bay, 20.x.1953 (S. J. Paramonov) (in Australian National Insect Collection, Canberra).

Crosskey (1971) showed that the type of this species is lost. It was originally described from specimens in Bigot's collection said to be from Tasmania (though there is much uncertainty about the exact origins of the Australian specimens in Bigot's collection). Macquart's description of a brown *Rutilia* in which the abdomen has the 'deuxième segment muni de huit à douze soies au bord postérieur' (i.e. T<sub>3</sub> with a transverse row of 8-12 median marginal setae in modern terminology) can only relate to a species of *Rutilia* s. str. close to *vivipara* (Fab.); however it is clearly not *vivipara* itself, which has entirely reddish yellow legs, because Macquart records 'pedibus nigris; tibiis testaceis'. In New South Wales there occurs a species close to *vivipara* but having the femora and tarsi largely blackish and contrasting with the reddish yellow tibiae, and it is to this species (until now unnamed) that Macquart's name *setosa* is considered to apply, and from which the neotype here chosen is designated. *Rutilia setosa* Macquart differs from *R. vivipara* (Fabricius) by having the suprasquamal ridge bare, as well as in the leg coloration mentioned.

***Tachina vivipara* Fabricius, 1805 : 309.**

NEOTYPE ♂. AUSTRALIA, New South Wales, Barrington Tops, 9.iv.1949 (S. J. Paramonov) (in Australian National Insect Collection, Canberra).

The provenance of Fabricius' material has always been assumed to be Australia, though the locality was cited as 'Insulis maris pacifici' in the original description; Fabricius' description fits so well with the common eastern Australian *Rutilia* species that has always been accepted as *vivipara* that there is really no doubt about the true identity, and a specimen from New South Wales fitting with both the past concept of *vivipara* and with Fabricius' description is here designated as neotype. As *vivipara* is type-species of *Rutilia*, this neotype is the nomenclatorial

pivot of the Rutiliini. For further information on *vivipara* see under the discussion of *Rutilia* sensu stricto (p. 77).

# SUMMARY OF THE PROPOSED CLASSIFICATION OF THE RUTILIINI

The following synoptic catalogue shows all the genus-group and species-group taxa of Rutiliini, together with their synonyms, arranged in accordance with the classification of the tribe here proposed. Names that are considered taxonomically and nomenclaturally valid are printed in bold-face type, synonyms are indented, and misidentifications are indicated by brackets around the misapplied names; only the most important misidentifications are noted. Specific names are alphabetical within their higher taxon.

## Family TACHINIDAE Robineau-Desvoidy, 1830

### Subfamily PROSENINAE (Townsend, 1892<sup>4</sup>)

### Tribe RUTILIINI Brauer & Bergenstamm, 1889

#### Genus **FORMOSIA** Guérin-Méneville, 1843

##### Subgenus **FORMOSIA** Guérin-Méneville, 1843 s. str.

##### **PANCALA** Enderlein, 1936 **syn. n.**

##### *viridiventris*-group

##### *viridiventris* Crosskey **sp. n.**

##### *mirabilis*-group

##### *blattina* (Enderlein, 1936) **comb. n.**

##### *bracteata* (Enderlein, 1936) **comb. n.**

##### *callipygos* Gerstaecker, 1860

##### *eos* (Enderlein, 1936) **comb. n.**

##### *fervens* (Walker, 1861)

##### *flavipennis* (Macquart, 1848)

##### *gemmata* (Enderlein, 1936) **comb. n.**

##### *viridescens* (Enderlein, 1936)

##### *glorificans* (Walker, 1861)

##### *pectoralis* (Walker, 1865) **syn. n.**

##### *fulvipes* (Enderlein, 1936)

##### *heinrichiana* (Enderlein, 1936) **comb. n.**

##### *heinrothi* (Enderlein, 1936) **comb. n.**

##### *mirabilis* (Guérin-Méneville, 1831)

##### *plumicornis* (Macquart, 1843)

##### *solomonicola* Baranov, 1936 **stat. n.**

##### Subgenus **PSEUDOFORMOSIA** Brauer & Bergenstamm, 1889

##### **LACCURA** Enderlein, 1936 **syn. n.**

##### *excelsa* (Walker, 1862) **comb. n.**

##### *moneta* Gerstaecker, 1860

##### *lucigena* (Walker, 1861) **syn. n.**

##### *obscuripennis* Brauer & Ber- genstamm, 1889 (unavail- able)

##### *pauper* (de Meijere, 1904) **comb. n.**

##### *saturatissima* (Walker, 1861)

##### Subgenus **EUAMPHIBOLIA** Townsend, 1916

##### *HEGA* Enderlein, 1936 **syn. n.**

##### **CHROMOCHARIS** Ender- lein, 1936 **syn. n.**

##### *atribasis* (Walker, 1861)

##### *complicita* (Walker, 1861) **comb. n.**

##### *pretiosa* (Snellen van Vollen- hoven, 1863) **syn. n.**

##### *sapphirina* (Walker, 1862) **syn. n.**

##### *smaragdifera* Bigot, 1874 **syn.** **n.**

##### *viridicingens* (Enderlein, 1936) **syn. n.**

##### *engeli* (Enderlein, 1936) **comb. n.**

##### *faceta* (Enderlein, 1936) **comb. n.**

##### *fusca* Crosskey **sp. n.**

<sup>4</sup> See the Introduction for a note on the nomenclatural position of this name.

*smaragdina* Malloch, 1929  
*speciosa* (Erichson, 1842)  
     *fulvipes* (Guérin-Ménéville,  
     1843)

Genus **FORMODEXIA** gen. n.  
     *volucelloides* (Walker, 1861) **comb. n.**  
     *ignobilis* (Walker, 1864) **syn. n.**  
     *trixoides* (Walker, 1861) **syn. n.**

Genus **RUTILODEXIA** Townsend, 1915  
     *BOTHROSTIRA* Enderlein, 1936 **syn. n.**  
     *RUTILIOSIA* Paramonov, 1968 (un-  
     available)  
     *angustipennis* (Walker, 1859)  
     *papua* (Bigot, 1880) **comb. n.**  
     *prisca* (Enderlein, 1936) **comb. n.**  
         *valumensis* (Enderlein, 1936)  
         **syn. n.**

Genus **RUTILIA** Robineau-Desvoidy, 1830

Subgenus **NEORUTILIA** Malloch, 1936  
     *simplex* Malloch, 1936

Subgenus **AMENIAMIMA** subgen. n.  
     *argentifera* Bigot, 1874  
         *frontosa* (Malloch, 1929) **syn.**  
         **n.**  
     *cingulata* (Malloch, 1930)  
     *quadripunctata* (Malloch, 1930)  
         **comb. n.**

Subgenus **CHRYSORUTILIA** Townsend,  
     1915 **stat. n.**  
     *PHILIPPOFORMOSIA*  
         Townsend, 1927 **syn. n.**  
     *HABROTA* Enderlein, 1936  
     *ZORAMSCEUS* Enderlein,  
         1936 **syn. n.**  
     *IDANIA* Enderlein, 1936  
         **syn. n.**  
     *FORMOTILIA* Paramonov,  
         1968 (unavailable)

**atrox-group**  
     *atrox* (Enderlein, 1936) **comb. n.**

**luzona-group**  
     *luzona* (Enderlein, 1936) **comb. n.**  
     *townsendi* **nom. n.**  
         *splendida* (Townsend, 1927)  
         (preoccupied)

**formosa-group**  
     *caeruleata* (Enderlein, 1936) **comb. n.**  
         *lineata* (Enderlein, 1936)  
         **syn. n.**  
     *caesia* (Enderlein, 1936) **comb. n.**  
         *rufibarbis* (Enderlein, 1936)  
         **syn. n.**  
         *viridescens* (Enderlein, 1936)  
     *chersipho* (Walker, 1849)  
         *erichsonii* Engel, 1925 **syn. n.**  
     *corona* Curran, 1930  
     *cryptica* Crosskey **sp. n.**  
     *decora* Guérin-Ménéville, 1843  
     *formosa* Robineau-Desvoidy, 1830  
         *pubicollis* Thomson, 1869  
         **syn. n.**  
         *subvittata* Malloch, 1929  
         *uzita* (Walker, 1849) **syn. n.**  
     *goerlingiana* (Enderlein, 1936)  
         **comb. n.**  
     *idesa* (Walker, 1849)  
     *imperialis* Guérin-Ménéville, 1843  
         *ruficornis* Bigot, 1880 **syn. n.**  
         *semifulva* Bigot, 1880 **syn. n.**  
     *imperialoides* Crosskey **sp. n.**  
     *nana* (Enderlein, 1936) **comb. n.**  
     *panthea* (Walker, 1849)  
     *rubriceps* Macquart, 1847  
         *angustigena* (Enderlein, 1936)  
         **syn. n.**  
         *formosina* Curran, 1930 **syn. n.**  
         *nitens* Macquart, 1851 **syn. n.**  
         *serena* (Walker, 1849) **syn. n.**  
     *splendida* (Donovan, 1805)  
         *australasia* Gray, 1832  
         *confluens* (Enderlein, 1936)  
         *evanescens* (Enderlein, 1936)  
     *transversa* Malloch, 1936

Subgenus **DONOVANIUS** Enderlein,  
     1936 **stat. n.**  
     *PSARONIA* Enderlein, 1936  
         **syn. n.**  
     *MENEVILLEA* Enderlein,  
         1936 **syn. n.**  
     *agalmiodes* (Enderlein, 1936)  
         **comb. n.**  
     *analogia* Macquart, 1851  
         *dubitata* Malloch, 1929 **syn. n.**  
     *bisetosa* (Enderlein, 1936) **comb. n.**  
         *nigribasis* (Enderlein, 1936)  
         **syn. n.**  
     *brunneipennis* Crosskey **sp. n.**  
     *ethoda* (Walker, 1849)

- inusta** (Wiedemann, 1830)  
*castanifrons* Bigot, 1880 **syn. n.**  
*castanipes* Bigot, 1880 **syn. n.**  
*potina* (Walker, 1849) **syn. n.**  
*spinipectus* Thomson, 1869  
**syn. n.**
- lepida** Guérin-Méneville, 1843  
*fulgida* Macquart, 1846 **syn. n.**  
*onoba* (Walker, 1849) **syn. n.**
- nigrihirta** Malloch, 1935
- pellucens** Macquart, 1846  
*imitator* (Enderlein, 1936)  
**syn. n.**
- regalis** Guérin-Méneville, 1831  
*nigra* Macquart, 1846 **nomen nudum**
- retusa** (Fabricius, 1775)  
*aditha* (Walker, 1849) **syn. n.**  
*viriditestacea* Macquart, 1851  
**syn. n.**
- sabrata** (Walker, 1849)  
*[inornata* G.-M. sensu auct. (misident.)]
- savaliensis** Malloch, 1935
- spinolae** Rondani, 1864
- transfuga** Bezzi, 1928
- viridinigra** Macquart, 1846  
*barcha* (Walker, 1849) **syn. n.**  
*fuscotestacea* Macquart, 1846  
**syn. n.**

Subgenus **RUTILIA** Robineau-Desvoidy, 1830 **s. str.**

- PSARONIELLA** Enderlein, 1936 **syn. n.**  
**STIRAULEX** Enderlein, 1936

- confusa** (Malloch, 1929)
- dentata** Crosskey **sp. n.**
- setosa** Macquart, 1847  
*[castanipes* Bigot sensu Enderlein (misident.)]
- vivipara** (Fabricius, 1805)  
*desvoidyi* Guérin-Méneville, 1843 **syn. n.**  
*durvillei* Robineau-Desvoidy, 1830 **syn. n.**  
*inornata* Guérin-Méneville, 1843, **syn. n.**

Subgenus **GRAPHOLOSTYLUM** Macquart, 1851 **stat. n.**

- AGALMIA** Enderlein, 1936  
**syn. n.**

- albovirida** Malloch, 1929
- dorsomaculata** (Macquart, 1851)  
*albopicta* Thomson, 1869  
**syn. n.**  
*fuscisquama* Malloch, 1930  
**syn. n.**  
*leucosticta* Schiner, 1868  
**syn. n.**  
*variegata* Bigot, 1874 **syn. n.**
- micans** Malloch, 1929
- subtustomentosa** Macquart, 1851  
*velutina* Bigot, 1874 **syn. n.**

Subgenus **MICRORUTILIA** Townsend, 1915

**PROSENOTOMA** Townsend, 1932 **syn. n.**

**EUCOMPSA** Enderlein, 1936

**POGONAGALMIA**

Enderlein, 1936, **syn. n.**

- cupreiventris** Malloch, 1936 **stat. n.**
- fulviventris** Bigot, 1874

*flavipes* (Brauer & Bergenstamm, 1889) **syn. n.**

**hirticeps** Malloch, 1929

*pallens* Curran, 1930 **syn. n.**

*[flavipes* B. & B. sensu Townsend (misident.)]

**liris** (Walker, 1849)

**media** Macquart, 1846

*ruficornis* (Macquart, 1851)  
**syn. n.**

**minor** Macquart, 1846

**nigriceps** Malloch, 1929

**nigripes** (Enderlein, 1936) **comb. n.**

Subgenerically unplaced species-group taxa

**micropalpis** Malloch, 1929

**scutellata** (Enderlein, 1936) (variety)

Genus **AMPHIBOLIA** Macquart, 1843

Subgenus **AMPHIBOLIA** Macquart, 1843  
**s. str.**

**albocincta** (Malloch, 1930)

**campbelli** Paramonov, 1950

**commoni** Paramonov, 1968

**ignorata** Paramonov, 1950

**papuana** Crosskey **sp. n.**

**valentina** Macquart, 1843

*vidua* (Guérin-Méneville, 1843)

**wilsoni** Paramonov, 1950

Subgenus **PARAMPHIBOLIA** Brauer & Bergenstamm, 1891 **stat. n.**

*CHAETOGASTRINA* Malloch, 1929 **syn. n.**  
*assimilis* (Macquart, 1851) **comb. n.**  
*stolida* (Malloch, 1929) **comb. n.**

Genus *CHRYSOPASTA* Brauer & Bergenstamm, 1889

*ROEDERIA* Brauer & Bergenstamm, 1893

*ECHRYSOPASTA* Townsend, 1932

*elegans* (Macquart, 1846)  
*versicolor* Brauer & Bergenstamm, 1889  
*zabirna* (Walker, 1849)

Genus *PRODIAPHANIA* Townsend, 1927

*DIAPHANIA* Macquart, 1843 (pre-occupied)

[*SENOSTOMA* sensu auct., not Macquart]

*arida* Paramonov, 1968  
*biarmata* (Malloch, 1936)  
*brevitarsis* Paramonov, 1968  
*claripennis* Malloch, 1929  
*communi* Paramonov, 1968  
*cygnus* (Malloch, 1936)  
*deserta* Paramonov, 1968  
*echinomides* (Bigot, 1874)  
*fullerae* Paramonov, 1968  
*funnebris* Paramonov, 1968  
*furcata* (Malloch, 1936)  
*genitalis* Paramonov, 1968  
*paratestacea* Paramonov, 1968  
**syn. n.**

*georgei* Malloch, 1929  
*minuta* Paramonov, 1968  
*regina* (Malloch, 1936)  
*testacea* (Macquart, 1843)  
*victoriae* (Malloch, 1936)  
*vittata* (Macquart, 1855)  
*walkeri* Paramonov, 1968

Genus *CHETOGASTER* Macquart, 1851

*CODIUM* Enderlein, 1936

*CHAETOGASTER*: incorrect subsequent spelling

*argentifera* Malloch, 1936  
*auriceps* Paramonov, 1968  
*canberrae* Paramonov, 1954  
*oblonga* (Macquart, 1847)  
*gratiosa* Paramonov, 1954  
**syn. n.**  
*pellucida* Paramonov, 1954  
*violacea* Macquart, 1851  
*viridis* Malloch, 1936

Nomina nuda (unplaceable)

*Diaphania grisea* Brauer & Bergenstamm, 1891  
*Formosia viridithorax* Bigot, 1874  
*Rutilia accedens* Brauer & Bergenstamm, 1891  
*Rutilia erronea* Paramonov, 1968  
*Rutilia humeralis* Paramonov, 1968  
*Rutilia incomparabilis* Brauer & Bergenstamm, 1891  
*Rutilia soror* Brauer & Bergenstamm, 1891

#### INDEX-CATALOGUE OF SPECIES-GROUP NAMES AND THEIR TYPES

The index-catalogue given below provides a complete alphabetical list of the species-group names of Rutiliini, with a summary of essential information on each primary type. Each species-group name is cited in the original spelling and is accompanied by the following information:

Author; date and page reference of original publication; genus of original assignment (in parentheses); status and sex of primary type; authority for lectotype designation (if relevant); data of primary type (when available in the sequence: locality, altitude, date of collection, name of collector in italics); type-depository.

Any special annotations, such as explanatory notes on the nomenclatural status or dating of names, are given after the basic type information (unless the name is unavailable and therefore has no type). Nomenclaturally available names are printed in bold type and *nomina nuda* and other unavailable names are printed in

non-bold italics. (Surprisingly, there are no instances of primary homonymy in the Rutiliini.)

A few entries have been enclosed in square brackets and the names printed in non-bold italics; this indicates, for convenience, those few species that were described in Rutiline genera but which are considered not to belong in the Rutiliini.

The following abbreviations have been used for the museum collections in which the primary types are housed:

AM	Australian Museum, Sydney
AMNH	American Museum of Natural History, New York
ANIC	Australian National Insect Collection, Canberra
BMNH	British Museum (Natural History), London
IRSNB	Institut Royal des Sciences Naturelles de Belgique, Brussels
MHN	Musée d'Histoire Naturelle, Lille
MNHN	Muséum National d'Histoire Naturelle, Paris
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin
NM	Naturhistorisches Museum, Vienna
NMV	National Museum of Victoria, Melbourne
NR	Naturhistoriska Riksmuseum, Stockholm
RMNH	Rijksmuseum van Natuurlijke Historie, Leiden
SPHTM	School of Public Health and Tropical Medicine, Sydney
USNM	United States National Museum, Washington D.C.

Full bibliographic references to the works containing the original descriptions of the species-group taxa, or to the original use of a name if there is no description, can be found in the 'References' section on p. 140.

- accedens* Brauer & Bergenstamm, 1891: 418 (114) (*Rutilia*). *Nomen nudum* (no later validation).
- aditha*** Walker, 1849: 854 (*Dexia*). Holotype ♂, AUSTRALIA (Western Australia, Swan River): BMNH, London.
- agalmiodes*** Enderlein, 1936: 412 (*Donovanius*). Holotype ♂, AUSTRALIA (Queensland, Cairns, 1907): MNHU, Berlin.
- agalmiodes* Enderlein, 1936: 434 (*Prosenostoma*, as aberration of *ruficorne* Macquart, 1851) Infrasubspecific name without status in nomenclature.
- albocincta*** Malloch, 1930: 108 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Barrington Tops, ii.1925, *S.U. Zool. Exp.*): ANIC, Canberra.
- albopicta*** Thomson, 1869: 529 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Sydney, *Kinb.*): NR, Stockholm.
- albovirida*** Malloch, 1929: 307 (*Rutilia* (*Senostoma*)). Holotype ♀, AUSTRALIA (Queensland, Yeppoon, x.1924, *A. Musgrave*): AM, Sydney.
- analoga*** Macquart, 1851: 191 (218) (*Rutilia*). Holotype ♀ [publ. as ♂], AUSTRALIA (? New South Wales [publ. as 'Tasmanie']): MNHN, Paris.
- [*angustecarinata* Macquart, 1848: 211 (51) (*Rutilia*). Not Rutiliini. ♂ holotype discovered in 1971 in the remnants of Payen's collection, formerly in the Municipal Museum at Tournai and now in IRSNB, Brussels, shows that this nominal species is not a Rutiline but belongs in the Tachinid tribe Nemoraeni.]
- angustigena*** Enderlein, 1936: 403 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 117), AUSTRALIA (Queensland, Herberton, i.1910): MNHU, Berlin.

- angustipennis** Walker, 1859 : 101 (*Rutilia*). Holotype ♂, INDONESIA (Aru Islands, *A. R. Wallace*) : BMNH, London.
- argentifera** Bigot, 1874 : 464 (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 300), AUSTRALIA (New South Wales, Sydney) : BMNH, London.
- argentifera** Malloch, 1936 : 19 (*Chaetogaster*). Holotype ♀, AUSTRALIA (Victoria, Gisborne, 25.ii.1923, *G. Lyell*) : SPHTM, Sydney.
- arida** Paramonov, 1968 : 397 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Victoria, Little Desert, 5 miles S. of Kiata, 13.ii.1956, *I. F. B. Common*) : ANIC, Canberra.
- assimilis** Macquart, 1851 : 192 (219) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 285), AUSTRALIA (Tasmania) : MNHN, Paris.
- Macquart cited the type-locality as 'Nouvelle-Hollande: côte orientale' in the original description, but Crosskey (1970) established, from accession reference numbers on the type-material, that Tasmania is the correct provenance.
- atribasis** Walker, 1861b : 288 (*Rutilia*). Lectotype ♀, by present designation (p. 119), INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.
- atrox** Enderlein, 1936 : 408 (*Idania*). Holotype ♀, PHILIPPINE REPUBLIC (Luzon, Imugan, 6.vi.1918, *Georg Böttcher*) : MNHU, Berlin.
- auriceps** Paramonov, 1968 : 371 (*Chaetogaster*). Holotype ♀, AUSTRALIA (Queensland, Collinsville, 15.ix.1950, *E. F. Riek*) : ANIC, Canberra.
- australasia** Gray in Cuvier, 1832 : pl. 114, fig. 1 & p. 793 [index] (*Rutilia*). Holotype or syntypes [♀], AUSTRALIA : lost.
- The description of this nominal species consists of a good figure by Gray clearly showing a ♀ *Rutilia*, and of the words 'Black and blue' appearing in the index on p. 793 of the second *Insecta* volume of Cuvier's *The Animal Kingdom*. No specimen or specimens that could have formed the basis for Gray's figure have been located, and the type-material is therefore presumed lost. Walker (1849 : 863) synonymized the name *R. australasia* Gray with *R. splendida* (Donovan); this synonymy, which is fully justified by Gray's excellent figure, is here upheld as certainly correct.
- barcha** Walker, 1849 : 857 (*Dexia*). Holotype ♀, AUSTRALIA : BMNH, London.
- biarmata** Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, AUSTRALIA (South Australia, *J. B. Cleland*) : SPHTM, Sydney.
- bisetosa** Enderlein, 1936 : 414 (*Psaronia*). Lectotype ♀, by present designation (p. 119), AUSTRALIA (Western Australia, Wurarga, Marloo Station, 1935, *Goerling*) : MNHU, Berlin.
- blattina** Enderlein, 1936 : 423 (*Pancala*). Holotype ♀, INDONESIA (Celebes, Latimodjong Mts, 1300-1500 m, vii.1930, *G. Heinrich*) : MNHU, Berlin.
- bracteata** Enderlein, 1936 : 425 (*Pancala*). Holotype ♂, PAPUA NEW GUINEA (southern New Ireland ['Süd-Neu-Mecklenburg'], expd. *Friederici*) : MNHU, Berlin.
- brevitarsis** Paramonov, 1968 : 395 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, near Queanbeyan, 10.iii.1953, *S. J. Paramonov*) : ANIC, Canberra.
- brunneipennis** Crosskey, 1972 : (present paper) (*Rutilia* (*Donovanius*)). Holotype ♀, SOLOMON ISLANDS (Guadalcanal, Suta, 27.vi.1956, *E. S. Brown*) : BMNH, London.
- caeruleata** Enderlein, 1936 : 402 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 117), AUSTRALIA (Western Australia, Wurarga, Marloo station, ix.1935, *A. Goerling*) : MNHU, Berlin.
- caesia** Enderlein, 1936 : 402 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 117), AUSTRALIA (*Clement*) : MNHU, Berlin.
- callipygos** Gerstaecker, 1860 : 198 (*Formosia*). Holotype ♀, NEW GUINEA (*Felder*) : MNHU, Berlin.
- campbelli** Paramonov, 1950 : 523 (*Amphibolia*). Holotype ♂, AUSTRALIA (Australian Capital Territory, Blundell's near Canberra, 23.xi.1938, *T. G. Campbell*) : ANIC, Canberra.
- canberrae** Paramonov, 1954 : 277 (*Chaetogaster*). Holotype ♂, AUSTRALIA (Australian Capital Territory, Canberra, Black Mt, 30.xii.1929, *G. A. Currie*) : ANIC, Canberra.
- castanifrons** Bigot, 1880 : 88 (*Rutilia*). Holotype ♀, AUSTRALIA : BMNH, London.

- castanipes** Bigot, 1880 : 87 (*Rutilia*). Lectotype ♀, by designation of Crosskey (1971 : 300), AUSTRALIA : BMNH, London.
- chersipho** Walker, 1849 : 864 (*Dexia*). Neotype ♂, by present designation (p. 123), AUSTRALIA (Western Australia, Waroona, 21.xi.1908, *G. F. Berthoud*) : BMNH, London.
- cingulata** Malloch, 1930 : 105 (*Formosia*). Holotype ♂, AUSTRALIA (New South Wales, Wentworth Falls, 14.xii.1923, *Harrison*) : ANIC, Canberra.
- claripennis** Malloch, 1929 : 292 (*Prodiaphania*, as variety of *testacea* Macquart, 1843). Holotype ♂, AUSTRALIA (Western Australia, King George's Sound) : AM, Sydney.
- communi** Paramonov, 1968 : 363 (*Amphibolia*). Holotype ♀, AUSTRALIA (Victoria, Gram-pians, Fyan's Creek, 11.ii.1956, *I. F. B. Common*) : ANIC, Canberra.
- communi** Paramonov, 1968 : 389 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Victoria, Little Desert, 5 m. S. of Kiata, *I. F. B. Common*) : ANIC, Canberra.
- complicita** Walker, 1861b : 288 (*Rutilia*). Holotype ♂ [not ♀], INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.
- confluens** Enderlein, 1936 : 407 (*Chrysorutilia*, as variety of *splendida* Donovan, 1805) Lectotype ♂, by present designation (p. 118), AUSTRALIA (Queensland) : MNHU, Berlin.
- confusa** Malloch, 1929 : 309 (*Formosia*). Holotype ♂, AUSTRALIA (South Australia, Kangaroo Island, deep creek 20 m. from Kingscote, *E. Troughton*) : AM, Sydney.
- corona** Curran, 1930 : 3 (*Rutilia*). Holotype ♂, AUSTRALIA (New South Wales, *H. Edwards*) : AMNH, New York.
- cryptica** Crosskey, 1972 : (present paper) (*Rutilia* (*Chrysorutilia*)). AUSTRALIA (South Australia, near Moonta, 16.xi.1904, *W. Wesche*) : BMNH, London.
- cupreiventris** Malloch, 1936 : 18 (*Rutilia* (*Microrutilia*) as variety of *ruficornis* Macquart, 1851). Holotype ♂, AUSTRALIA (New South Wales, Barrington Tops, ii.1925, *S.U. Zool. Exp.*) : SPHTM, Sydney.
- cygnus** Malloch, 1936 : 15 (*Senostoma*). Holotype ♂, AUSTRALIA (Western Australia, Swan River, *L. J. Newman*) : SPHTM, Sydney.
- decora** Guérin-Méneville, 1843 : 266 (*Rutilia*). Neotype ♂, by present designation (p. 124), AUSTRALIA (Queensland, Burpengary, *T. L. Bancroft*) : BMNH, London.
- dentata** Crosskey, 1972 : (present paper) (*Rutilia* (*Rutilia*)). Holotype ♂, AUSTRALIA (Victoria, Monbulk) : BMNH, London.
- deserta** Paramonov, 1968 : 398 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, Wanaaring, 29.x.1949, *S. J. Paramonov*) : ANIC, Canberra.
- desvoidyi** Guérin-Méneville, 1843 : 269 (*Rutilia*). Lectotype ♀, by present designation (p. 119), AUSTRALIA : MNHN, Paris.
- [*diversa* Paramonov, 1954 : 280 (*Chaetogaster*). Not Rutiliini as herein defined.]
- dorsomaculatum** Macquart, 1851 : 196 (223) (*Grapholostylum*). Lectotype ♂, by designation of Crosskey (1971 : 271), AUSTRALIA ('Tasmanie', probably error for New South Wales) : MNHN, Paris.
- [*dubia* Macquart, 1846 : 311 (183) (*Rutilia*). Not Tachinidae, see Crosskey (1971 : 285).]
- dubitata** Malloch, 1929 : 303 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Jindabyne, iii.1889, *Helms*) : AM, Sydney.
- durvillei** Robineau-Desvoidy, 1830 : 321 (*Rutilia*). Neotype ♂, by present designation (p. 124), AUSTRALIA (New South Wales, Hawkesbury River, 28.xi.1914) : BMNH, London.
- echinomides** Bigot, 1874 : 466 (*Rutilia*). Holotype ♀, AUSTRALIA : BMNH, London.
- elegans** Macquart, 1846 : 309 (181) (*Rutilia*). Holotype ♂, AUSTRALIA (New South Wales, Sydney) : BMNH, London.
- engeli** Enderlein, 1936 : 431 (*Laccura*). Lectotype ♀, by present designation (p. 118), INDONESIA (Banda Islands, Run [= Roon] Island, south of Ceram) : MNHU, Berlin.
- eos** Enderlein, 1936 : 423 (*Pancala*). Lectotype ♂, by present designation (p. 118), INDONESIA (Celebes, Bonthain, Wawa Karaeng, 1100 m., viii.1931, *G. Heinrich*) : MNHU, Berlin.
- erichsonii** Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (later validated as *erichsonii* Engel, q.v.).
- erichsonii** Engel, 1925 : 363 (*Rutilia*). Lectotype ♀, by fixation of Malloch (1929 : 297),

AUSTRALIA (Western Australia, Swan River) : NM, Vienna.

*erronea* Paramonov, 1968 : 356, 361 (*Rutilia*). *Nomen nudum*.

This name was published in Paramonov's (1968) posthumous paper on Rutiliini in the discussion of the genus *Amphibolia* Macquart and in the preamble to the description there given of *A. albocincta* (Malloch); there is no definition of the taxon, and the name *erronea* is unavailable (*nomen nudum*).

*ethoda* Walker, 1849 : 856 (*Dexia*). Holotype ♀, AUSTRALIA (Western Australia, Swan River) : BMNH, London.

*evanescens* Enderlein, 1936 : 407 (*Chrysorutilia*, as variety of *splendida* Donovan, 1805). Holotype ♂, AUSTRALIA (*Damel*) : MNHU, Berlin.

The holotype bears a label reading 'N. Holl/sept. Damel' and Enderlein (1936 : 407) interpreted this as northern Australia ('Nord-Australien'); this seems doubtful, and the provenance within Australia is here considered unknown.

*excelsa* Walker, 1862 : 19 (*Rutilia*). Holotype ♂, INDONESIA (Moluccas, Ternate, *A. R. Wallace*) : BMNH, London.

*faceta* Enderlein, 1936 : 422 (*Hega*). Holotype ♂, AUSTRALIA (N. Queensland) : MNHU, Berlin.

*fervens* Walker, 1861 : 288 (*Rutilia*). Holotype ♀, INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.

*flavipennis* Macquart, 1848 : 210 (50) (*Rutilia*). Holotype ♂, JAVA (*Payen*) : IRSNB Brussels (ex Municipal Mus., Tournai).

Crosskey (1971 : 286) could not locate the original material of this species during work on Macquart's types, but the ♂ holotype was located during the present work in the remnants of Payen's collection (now in Brussels) from the Municipal Museum, Tournai. It consists of the eaten out shell of head and thorax and abdominal venter, but all legs and genitalia are present and the identity is clear; the body is discoloured.

*flavipes* Brauer & Bergenstamm, 1889 : 126 (58) (*Senostoma*). Lectotype ♀, by present designation (p. 121), AUSTRALIA ('New Holland') : NM, Vienna.

*formosa* Robineau-Desvoidy, 1830 : 320 (*Rutilia*). Neotype ♂, by present designation (p. 124) AUSTRALIA (New South Wales, near Lake George, 25.xi.1953, *S. J. Paramonov*) : ANIC, Canberra.

*formosina* Curran, 1930 : 2 (*Rutilia*). Holotype ♂, AUSTRALIA : AMNH, New York.

*frontosa* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (later validated as *frontosa* Malloch, q.v.).

*frontosa* Malloch, 1929 : 310 (*Formosia*). Holotype ♂, AUSTRALIA (New South Wales, Jindabyne, 3000 ft, iii.1889, *Helms*) : AM, Sydney.

*fu'gida* Macquart, 1846 : 308 (180) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 286), AUSTRALIA (New South Wales, Sydney) : BMNH, London.

*fullerae* Paramonov, 1968 : 393 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, Barrington Tops, 29-30.xii.1934, *M. E. Fuller*) : ANIC, Canberra.

*fulvipes* Enderlein, 1936 : 426 (*Pancala*, as variety of *glorificans* Walker, 1861) Holotype ♀, PAPUA NEW GUINEA (Milne Bay, *Micholitz*) : MNHU, Berlin.

*fulvipes* Guérin-Méneville, 1843 : 273 (*Rutilia*). Holotype ♀, AUSTRALIA : lost.

*fulviventris* Bigot, 1874 : 465 (*Rutilia*). Lectotype ♀, by designation of Crosskey (1971 : 301), AUSTRALIA (Tasmania) : BMNH, London.

*funebri* Paramonov, 1968 : 391 (*Prodiaphania*) Holotype ♂, AUSTRALIA (South Australia, 40 m. S.W. of Iron Knob, 23.x.1958, *I. F. B. Common*) : ANIC, Canberra.

*furcata* Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, AUSTRALIA (Australian Capital Territory, Canberra, 16.xii.1928, *M. Fuller*) : ANIC, Canberra.

*fusca* Crosskey, 1972 : (present paper) (*Formosia* (*Euamphibolia*)). Holotype ♂, INDONESIA (Moluccas, Seram, Mansela, 2500 ft, 1919, *Pratt*) : BMNH, London.

*fuscisquama* Malloch, 1930 : 107 (*Rutilia*, as variety of *leucosticta* Schiner, 1868). Holotype ♀, AUSTRALIA (New South Wales, Barrington Tops, Allyn Range, ii.1925, on *Leptospermum*, *S.U. Zool. Exp.*) : ANIC, Canberra.

- fuscotestacea* Macquart, 1846 : 306 (178) (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Sydney) : BMNH, London.
- gemmata* Enderlein, 1936 : 424 (*Pancala*). Lectotype ♂, by present designation (p. 118), PAPUA NEW GUINEA (New Britain, Ralum, Karakaul, 30.viii.1896, in high forest, *F. Dahl*) : MNHU, Berlin.
- genitalis* Paramonov, 1968 : 400 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Queensland, Herberton, ii.1911) : BMNH, London.
- georgei* Malloch, 1929 : 292 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Western Australia, King George's Sound) : AM, Sydney.
- glorificans* Walker, 1861a : 241 (*Rutilia*). Holotype ♂, INDONESIAN NEW GUINEA (Dorey, *A. R. Wallace*) : BMNH, London.
- goerlingiana* Enderlein, 1936 : 404 (*Chrysorutilia*). Lectotype ♀, by present designation (p. 117), AUSTRALIA (Western Australia, Wurarga, Marloo Station, i.1935, *A. Goerling*) : MNHU, Berlin.
- gratiosa* Paramonov, 1954 : 283 (*Chaetogaster*). Holotype ♂, AUSTRALIA (Victoria, Wonnangatta River, Gibraltar Point, 12.xii.1949, *T. G. Campbell*) : ANIC, Canberra.
- grisea* Brauer & Bergenstamm, 1891 : 417 (113) (*Diaphania*). *Nomen nudum* (no later validation).
- heinrichiana* Enderlein, 1936 : 426 (*Pancala*). Holotype ♂, INDONESIA (Celebes, Bonthain, Wawa Karaeng, 1100 m, ix-x.1931 *G. Heinrich*) : MNHU, Berlin.
- heinrothi* Enderlein, 1936 : 425 (*Pancala*). Holotype ♀, PAPUA NEW GUINEA (New Britain, Matupi, xii.1900-v.1901, *Heinroth*) : MNHU, Berlin.
- hirticeps* Malloch, 1929 : 305 (*Rutilia* (*Senostoma*)). Holotype ♂, AUSTRALIA (New South Wales, Monaro, Moonbar, 3000-3500 ft, iii.1889, *Helms*) : AM, Sydney.
- humeralis* Paramonov, 1968 : 355 (*Rutilia*). *Nomen nudum*.
- This name was published in the expression '*Rutilia humeralis* group' in Paramonov's (1968) posthumous paper on Rutiliini in the key to genera (p. 355); there is no definition of the specific taxon and the name is unavailable (*nomen nudum*).
- idesa* Walker, 1849 : 858 (*Dexia*). Holotype ♂ [not ♀], AUSTRALIA : BMNH, London.
- ignobilis* Walker, 1864 : 238 (*Rutilia*). Holotype ♀, INDONESIA (Moluccas, Halmahera, *A. R. Wallace*) : BMNH, London.
- Walker, in the original publication, cited the provenance of this nominal species as Gorrite (a locality in Brazil), but the specimen was actually collected by Wallace in the island of Gilolo (=Halmahera) and is so labelled.
- ignorata* Paramonov, 1950 : 522 (*Amphibolia*). Holotype ♂, AUSTRALIA (New South Wales Tindery i.i.1938, *Mackerras*) : ANIC, Canberra.
- imitator* Enderlein, 1936 : 412 (*Donovanius*). Holotype ♂, AUSTRALIA (*Behr*) : MNHU, Berlin.
- imperialis* Guérin-Méneville, 1843 : 265 (*Rutilia*). Neotype ♂, by present designation (p. 125), AUSTRALIA (New South Wales, Mt Wilson, 2.i.1953, *M. F. Day*) : ANIC, Canberra.
- imperialoides* Crosskey, 1972 : (present paper) (*Rutilia* (*Chrysorutilia*)). Holotype ♂, AUSTRALIA (New South Wales, Wee Jasper, xii.1920) : BMNH, London.
- incomparabilis* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (no later validation).
- inornata* Guérin-Méneville, 1843 : 268 (*Rutilia*). Lectotype ♀, by present designation (p. 119), AUSTRALIA : MNHN, Paris.
- inusta* Wiedemann, 1830 : 306 (*Tachina*). Lectotype ♀, by present designation (p. 121), AUSTRALIA (New South Wales, Sydney ['Port Jackson'], *Eschscholtz*) : MNHU, Berlin.
- lepida* Guérin-Méneville, 1843 : 268 (*Rutilia*). Neotype ♂, by present designation (p. 125), AUSTRALIA (Australian Capital Territory, Blundell's near Canberra, 19.iv.1948, *Paramonov*) : ANIC, Canberra.
- leucosticta* Schiner, 1868 : 319 (*Rutilia*). Holotype ♀, AUSTRALIA : NM, Vienna.
- Schiner, in the original publication, cited the provenance of this species as New Zealand ('Neuseeland'), but the holotype is labelled as from Australia ('New Holland'); the latter

is certainly correct, as the Rutiliini are absent from New Zealand. Engel (1925 : 364) and Malloch (1928 : 659) have correctly noted the Australian provenance.

**lineata** Enderlein, 1936 : 407 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia, Wurarga, Marloo Station, iv.1935, *A. Goerling*) : MNHU, Berlin.

**liris** Walker, 1849 : 882 (*Musca*). Holotype ♀, AUSTRALIA (? Tasmania) : BMNH, London.

The type-locality of *liris* is unknown, but the species to which the holotype belongs is found in Tasmania, and this is the most probable provenance of the type.

**lucigena** Walker, 1861a : 242 (*Rutilia*). Lectotype ♂, by present designation (p. 120), INDONESIAN NEW GUINEA (Dorey, *A. R. Wallace*) : BMNH, London.

**luzona** Enderlein, 1936 : 406 (*Chrysorutilia*). Holotype ♂, PHILIPPINE REPUBLIC (Luzon, Imugan, 30.vi.1918, *Georg Boettcher*) : MNHU, Berlin.

**media** Macquart, 1846 : 310 (182) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 286), AUSTRALIA (Tasmania) : MNHN, Paris.

**micans** Malloch, 1929 : 299 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Kosciusko, 5000 ft, iii.1889, *Helms*) : AM, Sydney.

**micropalpis** Malloch, 1929 : 298 (*Rutilia*). Holotype ♀, AUSTRALIA (New South Wales, Como near Sydney, 7.xi.1923, *J. T. Campbell & A. Musgrave*) : AM, Sydney.

**minor** Macquart, 1846 : 310 (182) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 286), AUSTRALIA (Tasmania) : MNHN, Paris.

**minuta** Paramonov 1968 : 399 (*Prodiaphania*). Holotype ♂, AUSTRALIA (Queensland, Gordonvale, 1923) : ANIC, Canberra.

**mirabilis** Guérin-Méneville, 1831 : plate 21, fig. 2 (*Rutilia*); 1838 : 296 (*Musca*). Holotype ♀ (head lost), INDONESIAN NEW GUINEA (Fak-Fak ['Offak']) : MNHN, Paris.

This name is available from publication of the plate figure (as *Rutilia mirabilis*) in 1831, which pre-dated the text description (as *Musca mirabilis*) published in 1838.

**moneta** Gerstaecker, 1860 : 200 (*Formosia*). Holotype ♀, NEW GUINEA (*Felder*) : MNHU, Berlin.

**nana** Enderlein, 1936 : 404 (*Chrysorutilia*). Holotype ♀, INDONESIA (Kai [=Kei] Islands) : MNHU, Berlin.

**nigra** Macquart, 1846 : 305 (177) (*Rutilia*). *Nomen nudum* (no later validation).

Specific named cited without definition of the taxon, but not as a synonym, in the original description of *Rutilia pellucens* Macquart, and unavailable (*nomen nudum*).

**nigribasis** Enderlein, 1936 : 411 (*Donovanius*, as variety of *fulgidus* Macquart, 1846). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia, Wurarga, Marloo Station, 6.vi.1935, *A. Goerling*) : MNHU, Berlin.

**nigriceps** Malloch, 1929 : 306 (*Rutilia* (*Senostoma*)). Holotype ♂, AUSTRALIA (New South Wales, East Dorriggo, Ulong, *W. Heron*) : AM, Sydney.

**nigrihirta** Malloch, 1935 : 349 (*Rutilia* (*Rutilia*)). Holotype ♂, SAMOA (Upolu, Malololelei, 2000 ft, 2.viii.1925, *Buxton & Hopkins*) : BMNH, London.

**nigripes** Enderlein, 1936 : 435 (*Prosenostoma*). Lectotype ♂, by present designation (p. 119), AUSTRALIA (Queensland, Herberton, 3700 ft, ii.1911, *Dodd*) : MNHU, Berlin.

[*nigrithorax* Macquart, 1851 : 190 (217) (*Rutilia*). Not Rutiliini as herein defined.]

**nitens** Macquart, 1851 : 189 (216) (*Rutilia*). Holotype ♀, INDIA : MNHN, Paris.

**oblonga** Macquart, 1847 : 92 (76) (*Rutilia*). Holotype ♂, AUSTRALIA : BMNH, London.

**obscuripennis** Brauer & Bergenstamm, 1889 : 126 (58) (*Formosia*); Brauer & Bergenstamm, 1891 : 434 (130) (*Pseudoformosia*) & 435 (131) (*Formosia*).

Name attributed to Bigot but published by Brauer & Bergenstamm in synonymy with *Pseudoformosia moneta* (Gerstaecker) and unavailable under Article 11 (d) of the *International Code of Zoological Nomenclature*, 1961.

**onoba** Walker, 1849 : 859 (*Dexia*). Holotype ♂, AUSTRALIA : BMNH, London.

**pallens** Curran, 1930 : 2 (*Rutilia*). Holotype ♂, AUSTRALIA (New South Wales) : AMNH, New York.

- panthea** Walker 1849 : 862 (*Dexia*). Holotype ♀ AUSTRALIA (Western Australia) : BMNH, London.
- papua** Bigot, 1880 : 87 (*Formosia*). Lectotype ♀ [not ♂] by designation of Crosskey (1971 : 298), NEW GUINEA (*L. Laglaise*) : BMNH, London.
- papuana** Crosskey, 1972 : (present paper) (*Amphibolia* (*Amphibolia*)). Holotype ♀, NEW GUINEA (Murmur Pass, 8600 ft, x.1961, *W. W. Brandt*) : BMNH, London.
- paratestacea** Paramonov, 1968 : 397 (*Prodiaphania*). Holotype ♂, AUSTRALIA (New South Wales, Wee Jasper, 26.i.1936, *M. Fuller*) : ANIC, Canberra.
- pauper** de Meijere, 1904 : 178 (*Pseudoformosia*). Lectotype ♂, by present designation (p. 119), INDONESIA (Moluccas, N. Halmahera, *Bernstein*) : RMNH, Leiden.
- pectoralis** Walker, 1865 : 114 (*Rutilia*). Holotype ♀, NEW GUINEA (*A. R. Wallace*) : BMNH, London.
- pellucens** Macquart, 1846 : 305 (177) (*Rutilia*). Neotype ♂, by present designation (p. 126), AUSTRALIA (New South Wales, Durras Bay, 15-30.x.1953, *F. M. Hull*) : BMNH, London.
- pellucida** Paramonov, 1954 : 276 (*Chaetogaster*, as variety of *argentifera* Malloch, 1936). Holotype ♂, AUSTRALIA (New South Wales, Toronto) : ANIC, Canberra.
- plumicornis** Macquart, 1843 : 239 (82) (*Rutilia*). INDONESIAN NEW GUINEA (Fak-Fak ['Offak']) : type-material lost or possibly represented by the holotype of *Rutilia mirabilis* Guérin-Méneville.
- It is possible that Macquart's name *plumicornis*, which he attributed to Guérin-Méneville in the original description, is based upon one and the same type-specimen as *Rutilia mirabilis* Guérin-Méneville: for further discussion of this possibility see Crosskey (1971 : 289).
- potina** Walker, 1849 : 857 (*Dexia*). Holotype ♀, AUSTRALIA (Tasmania) : BMNH, London.
- pretiosa** Snellen van Vollenhoven, 1863 : 15 (*Rutilia*). Lectotype ♂, by present designation (p. 120), INDONESIA (Moluccas, Ternate, *Bernstein*) : RMNH, Leiden.
- prisca** Enderlein, 1936 : 413 (*Bothrostira*). Holotype ♂, PAPUA NEW GUINEA (New Britain, Kinigunang [publ. as 'Kinikunang'], *C. Ribbe*) : MNHU, Berlin.
- pubicollis** Thomson, 1869 : 530 (*Rutilia*). Lectotype ♂, by present designation (p. 120), AUSTRALIA (New South Wales, Sydney, *Kinb.*) : NR, Stockholm.
- quadripunctata** Malloch, 1930 : 104 (*Formosia*). Holotype ♂, AUSTRALIA (Queensland, Eidsvold, xii.1922, *Mackerras*) : ANIC, Canberra.
- ralumensis** Enderlein, 1936 : 409 (*Idania*). Lectotype ♀, by present designation (p. 118), PAPUA NEW GUINEA (New Britain, Ralum, 30.viii.1896, *F. Dahl*) : MNHU, Berlin.
- regalis** Guérin-Méneville, 1831 : plate 21, fig. 1 (*Rutilia*); 1838 : 295 (*Musca*). Neotype ♂ by present designation (p. 126), AUSTRALIA (Australian Capital Territory, Tharwa 14.ii.1951, *S. J. Paramonov*) : ANIC, Canberra.
- This name is available from publication of the plate figure (as *Rutilia regalis*) in 1831, which pre-dated the text description (as *Musca regalis*) published in 1838.
- regina** Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, AUSTRALIA (Queensland, Eidsvold, xii. 1922) : SPHTM, Sydney.
- retusa** Fabricius, 1775 : 775 (*Musca*). Holotype ♀, AUSTRALIA : BMNH, London (Sir Joseph Banks coll.).
- rubriceps** Macquart, 1847 : 92 (76) (*Rutilia*). Holotype ♀, AUSTRALIA ('Tasmanie', possibly in error) : BMNH, London.
- This species was described from Tasmania, but the true provenance of the holotype is more probably Queensland (Crosskey, 1971 : 289).
- rufibarbis** Enderlein, 1936 : 405 (*Chrysorutilia*). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia, Wurarga, Marloo Station, ix-x.1934, *A. Goerling*) : MNHU, Berlin.
- ruficornis** Bigot, 1880 : 88 (*Rutilia*). Holotype ♂, AUSTRALIA : BMNH, London.
- This name is a junior secondary homonym in *Rutilia* of *R. ruficornis* (Macquart, 1851); no new name is required as *ruficornis* Bigot is a synonym of *R. imperialis* Guérin-Méneville.

- ruficornis** Macquart, 1851 : 193 (220) (*Diaphania*). Holotype ♂, AUSTRALIA (Tasmania) : MNHN, Paris.
- sabrata** Walker, 1849 : 855 (*Dexia*). Holotype ♀, AUSTRALIA : BMNH, London.
- sapphirina** Walker, 1862 : 9 (*Rutilia*). Holotype ♂, INDONESIA (Moluccas, Halmahera [as 'Gilolo'], *A. R. Wallace*) : BMNH, London.
- saturatissima** Walker, 1861b : 287 (*Rutilia*). Lectotype ♂, by present designation (p. 120), INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.
- savaiensis** Malloch, 1935 : 350 (*Rutilia* (*Rutilia*)). Holotype ♂, SAMOA (Savaii Island, Fagamalo, xi.1925, *Buxton & Hopkins*) : BMNH, London.
- scutellata** Enderlein, 1936 : 405 (*Chrysorutilia*, as variety of *media* Macquart, 1846). Holotype ♀, AUSTRALIA (South Australia, Adelaide, *Schomburgk*) : MNHU, Berlin.
- semifulva** Bigot, 1880 : 89 (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 301), AUSTRALIA : BMNH, London.
- serena** Walker, 1849 : 865 (*Dexia*). Neotype ♀, by present designation (p. 123), INDIA (Maharashtra, Purandhar, near Poona, c. 3000 ft, on bush, *E. P. Sewell*) : BMNH, London.
- setosa** Macquart, 1847 : 94 (78) (*Rutilia*). Neotype ♂, by present designation (p. 126), AUSTRALIA (New South Wales, 4 m. N. of Bateman's Bay, 20.x.1953, *S. J. Paramonov*) : ANIC, Canberra.
- simplex** Malloch, 1936 : 17 (*Rutilia* (*Neorutilia*)). Holotype ♂, AUSTRALIA (Queensland, Eidsvold, xii.1922) : SPHTM, Sydney.
- smaragdifera** Bigot, 1874 : 462 (*Formosia*). Lectotype ♂, by designation of Crosskey (1971 : 298), INDONESIA (Moluccas, Batjan) : BMNH, London.
- smaragdina** Malloch, 1929 : 312 (*Formosia*). Holotype ♀, AUSTRALIA (N. Queensland, Gordonvale, 2.x.1917, *E. Jarvis*) : AM, Sydney.
- solomonicola** Baranov, 1936 : 101 (*Formosia*, as subspecies of *mirabilis* Guérin-Méneville, 1831). Lectotype ♂, by designation of Sabrosky & Crosskey (1969 : 44), SOLOMON ISLANDS (Guadalcanal, Kaukau [publ. as 'Kankau'], 21.viii.1934, *R. J. A. W. Lever*) : BMNH, London.
- soror** Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum* (no later validation).
- speciosa** Erichson, 1842 : 273 (*Rutilia*). Lectotype ♀, by present designation (p. 120), AUSTRALIA (Tasmania, *Schayer*) : MNHU, Berlin.
- spinipectus** Thomson, 1869 : 530 (*Rutilia*). Lectotype ♂, by present designation (p. 120), AUSTRALIA (New South Wales, Sydney, *Kinb.*) : NR, Stockholm.
- spinolae** Rondani, 1864 : 23 (*Rutilia*). Holotype or syntypes, sex unknown, AUSTRALIA : not located, probably lost.
- The introduction to the paper in which this name was published suggests that the type-material should be in Naples, but (in spite of careful search of museum collections at Naples and Portici recently made on request) it has not been located there or elsewhere in Italy. The original material is probably lost, and the name remains enigmatic.
- splendida** Donovan, 1805 : plate fig. (unnumbered) and description (unpaginated) (*Musca*). Neotype ♂, by present designation (p. 123), AUSTRALIA (Queensland, Brisbane, 8.ix.1907, *A. J. C. Wightman*) : BMNH, London.
- splendida** Townsend, 1927 : 282 (*Philippiformosia*). Holotype ♀, PHILIPPINE REPUBLIC (Nueva Viscaya, Imugin, *Baker*) : USNM, Washington D.C.
- This name is a junior secondary homonym in *Rutilia* of *R. splendida* (Donovan, 1805), see *townsendi* **nom. n.**
- stolida** Malloch, 1929 : 313 (*Chaetogastrina*). Holotype ♂, AUSTRALIA (New South Wales, Barrington Tops, 20.i.1927, *T. G. Campbell*) : AM, Sydney.
- subtustomentosa** Macquart, 1851 : 191 (218) (*Rutilia*). Holotype ♂, AUSTRALIA (Tasmania) : MNHN, Paris.
- subvittata** Malloch, 1929 : 295 (*Rutilia*, as variety of *formosa* Robineau-Desvoidy, 1830). Holotype ♂, AUSTRALIA (Western Australia, King George's Sound) : AM, Sydney.
- testacea** Macquart, 1843 : 278 (121) (*Diaphania*). Holotype or syntypes ♂, AUSTRALIA : MHN, Lille.

For further detail on original material in Macquart's collection in Lille see Crosskey (1971 : 267).

**townsendi** **nom. n.** for *Philippoformosia splendida* Townsend, 1927, junior secondary homonym preoccupied in *Rutilia* by *R. splendida* (Donovan, 1805). For type-data see under *splendida* Townsend above.

**transfuga** Bezzi, 1928 : 192 (*Rutilia*). Holotype ♀, FIJI (Viwa, 26.x.1921, *H. W. Simmonds*) : BMNH, London.

Bezzi, in the original publication, recorded the type-locality in Fiji as 'Suva', but this was clearly an error due to misreading of the handwritten word 'Viwa' given on the data label of the holotype. Viwa, a small island of the Fiji group lying north-west of Viti Levu, is the correct type-locality.

**transversa** Malloch, 1936 : 15 (*Rutilia*). Holotype ♂, AUSTRALIA (Western Australia, Swan River, *J. Clark*) : SPHTM, Sydney.

**trixoides** Walker, 1861b : 289 (*Rutilia*). Holotype ♀, INDONESIA (Moluccas, Batjan, *A. R. Wallace*) : BMNH, London.

**uzita** Walker, 1849 : 860 (*Dexia*). Holotype ♀, AUSTRALIA : BMNH, London.

The locality was cited in the original description as 'New Holland ?' but the specimen must without doubt have originated from Australia.

**valentina** Macquart, 1843 : 279 (122) (*Amphibolia*). Holotype or syntypes ♂, AUSTRALIA : MHN, Lille.

For further detail on original material in Macquart's collection in Lille see Crosskey (1971 : 263).

**variegata** Bigot, 1874 : 461 (*Formosia*). Lectotype ♀, by designation of Crosskey (1971 : 299), AUSTRALIA : BMNH, London.

**velutina** Bigot, 1874 : 463 (*Formosia*). Lectotype ♀, by designation of Crosskey (1971 : 299), AUSTRALIA (Tasmania) : BMNH, London.

**versicolor** Brauer & Bergenstamm, 1889 : 171 (103) (*Chrysopasta*). Lectotype ♂, by fixation of Malloch (1928b : 616), AUSTRALIA (Western Australia, Swan River) : NM, Vienna.

The type-material of this species consists of a ♂ and a ♀ specimen with the same type-data; Malloch (1928b : 616) referred to the male as 'type' and the female as 'allotype', and cited the type-data, and his action is here accepted as providing a valid lectotype fixation.

**victoriae** Malloch, 1936 : 13 (*Senostoma*). Holotype ♂, AUSTRALIA (Victoria, Gisborne, 19.iii.1922, *G. Lyell*) : SPHTM, Sydney.

**vidua** Guérin-Ménéville, 1843 : 273 (*Rutilia*). Syntypes 1 ♂, 3 ♀, AUSTRALIA : lost.

**violacea** Macquart, 1851 : 198 (225) (*Chetogaster*). Holotype ♂, AUSTRALIA ('côte orientale', probably New South Wales) : MNHN, Paris.

**viridescens** Enderlein, 1936 : 424 (*Pancala*, as variety of *gemmata* Enderlein, 1936). Lectotype ♂, by present designation (p. 119), PAPUA NEW GUINEA (New Britain, Kinigunang, *C. Ribbe*) : MNHU, Berlin.

**viridescens** Enderlein, 1936 : 403 (*Chrysorutilia*, as variety of *caesia* Enderlein, 1936). Holotype ♀, AUSTRALIA (Queensland, *H. Peters*) : MNHU, Berlin.

**viridicingens** Enderlein, 1936 : 421 (*Hega*). Holotype ♂, INDONESIA (Moluccas, Batjan) : MNHU, Berlin.

**viridinigra** Macquart, 1846 : 307 (179) (*Rutilia*). Lectotype ♀, by designation of Crosskey (1971 : 290), AUSTRALIA (Tasmania) : MNHN, Paris.

**viridis** Malloch, 1936 : 19 (*Chaetogaster*). Holotype ♂, AUSTRALIA (New South Wales, Comboyne, *Chisholm*) : SPHTM, Sydney.

Malloch described this species from the male, as stated by him (Malloch, 1936 : 19, line 1) before the key but not in the description; the holotype is ♂, not ♀ as stated by Paramonov (1968 : 367).

**viriditestacea** Macquart, 1851 : 190 (217) (*Rutilia*). Lectotype ♂, by designation of Crosskey (1971 : 290), AUSTRALIA (Tasmania) : MNHN, Paris.

**viridithorax** Bigot, 1874 : 457 (*Formosia*). *Nomen nudum* (no later validation).

Bigot (*loc. cit.*) attributed the name *viridithorax* to Macquart with the citation '*Rutilia*

- id., Macq., Dipt. exot.', but the name was not published by Macquart and remains a *nomen nudum* attributable to Bigot.
- viridiventris** Crosskey, 1972 : (present paper) (*Formosia* (*Formosia*)). Holotype ♂, SOLOMON ISLANDS (Guadalcanal, Tapenanje, 10-30.ix.1953, J. D. Bradley) : BMNH, London.
- vittata** Macquart, 1855 : 126 (106) (*Rutilia*). Holotype ♀, AUSTRALIA (South Australia, Adelaide) : BMNH, London.
- vivipara** Fabricius, 1805 : 309 (*Tachina*). Neotype ♂, by present designation (p. 120), AUSTRALIA (New South Wales, Barrington Tops, 9.iv.1949, S. J. Paramonov) : ANIC, Canberra.
- volucelloides** Walker, 1861b : 289 (*Rutilia*). Lectotype ♀, by present designation (p. 120), INDONESIA (Moluccas, Batjan, A. R. Wallace) : BMNH, London.
- walkeri** Paramonov, 1968 : 400 (*Prodiaphania*). Holotype ♀, AUSTRALIA (Western Australia) : AMNH, New York.
- wilsoni** Paramonov, 1950 : 524 (*Amphibolia*). Holotype ♂, AUSTRALIA (Victoria, Warburton, 14.xii.1930, F. E. Wilson) : NMV, Melbourne (ex Wilson coll.).
- [*wilsoni* Paramonov, 1954 : 281 (*Chaetogaster*). Not Rutiliini as herein defined.]
- zabirna** Walker, 1849 : 863 (*Dexia*). Lectotype ♂, by present designation (p. 118), AUSTRALIA (Western Australia, Perth, G. Clifton) : BMNH, London.

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It is with much pleasure that I acknowledge the unfailing helpfulness of colleagues in other museums and institutions who have generously provided me with types and other material on loan. For such assistance I warmly thank the following: Mr D. M. Ackland (formerly at University Museum, Oxford); Dr Donald Colless (C.S.I.R.O., Canberra); Dr P. J. van Helsdingen (Rijksmuseum van Natuurlijke Historie, Leiden); Dr A. Kaltenbach (Naturhistorisches Museum, Vienna); Professor D. J. Lee (School of Public Health & Tropical Medicine, Sydney); Monsieur L. Matile (Muséum National d'Histoire Naturelle, Paris); Dr D. K. McAlpine (Australian Museum, Sydney); Dr Per Inge Persson (Naturhistoriska Riksmuseum, Stockholm); Dr Curtis Sabrosky (U.S.D.A./U.S.N.M., Washington, D.C.); Dr H. Schumann (Museum für Naturkunde der Humboldt-Universität, Berlin); Dr J. Verbeke (Institut Royal des Sciences Naturelles de Belgique, Brussels); Dr P. Wygodzinsky (American Museum of Natural History, New York).

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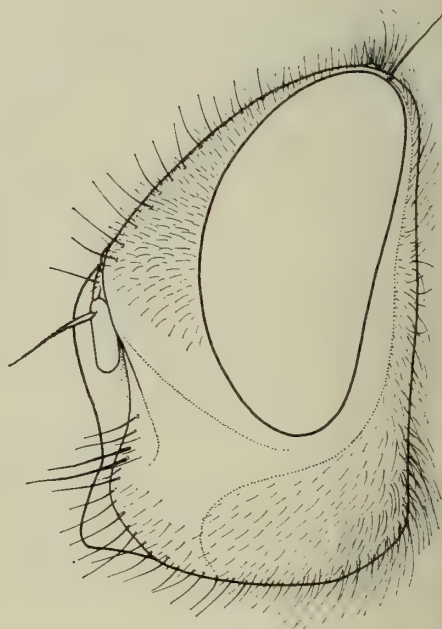
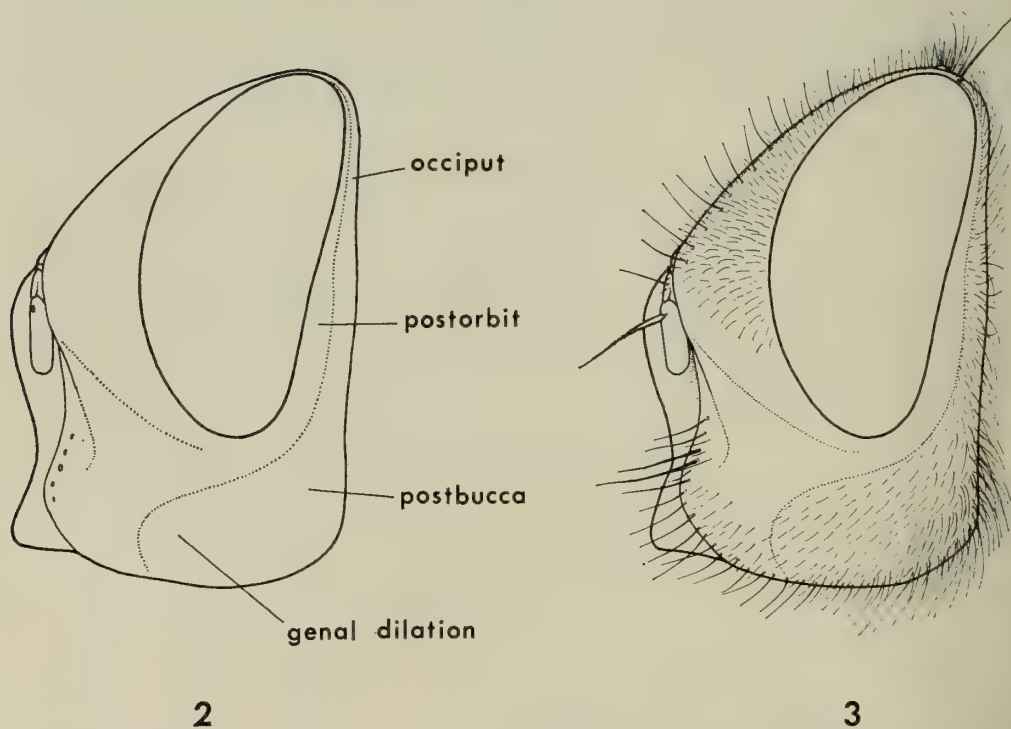
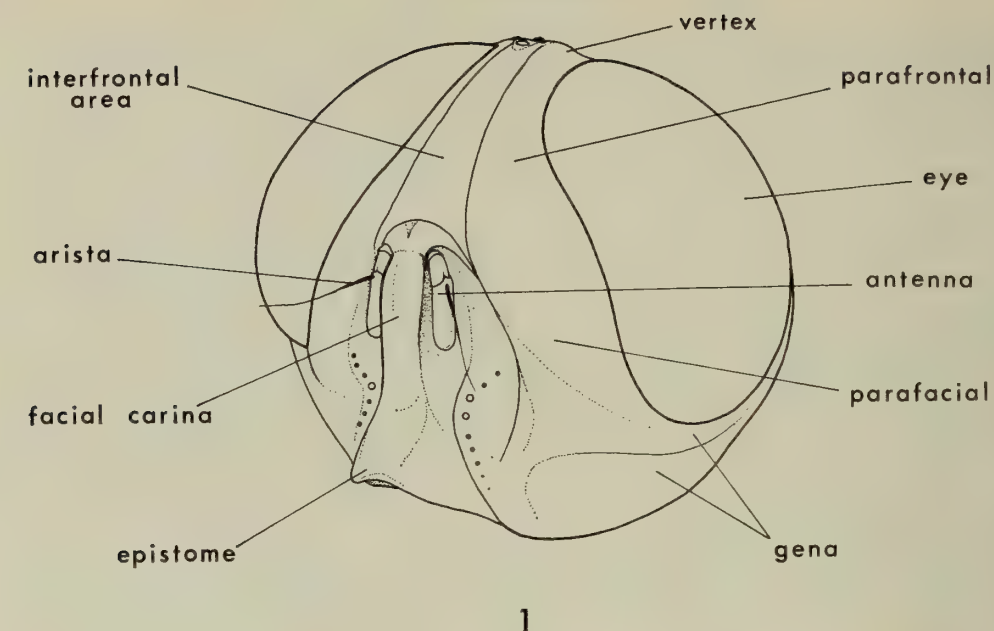
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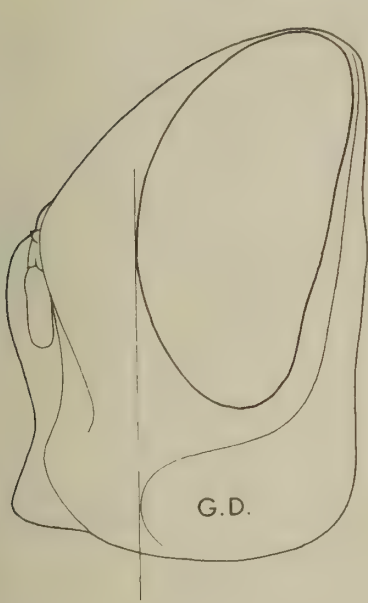
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FIGS 1-3. Head of a Rutiliine fly. 1 & 2, laterodorsal and profile views showing the terminology of main landmarks (vestiture omitted). 3, profile showing weak frontal bristling and vibrissae of typical forms.



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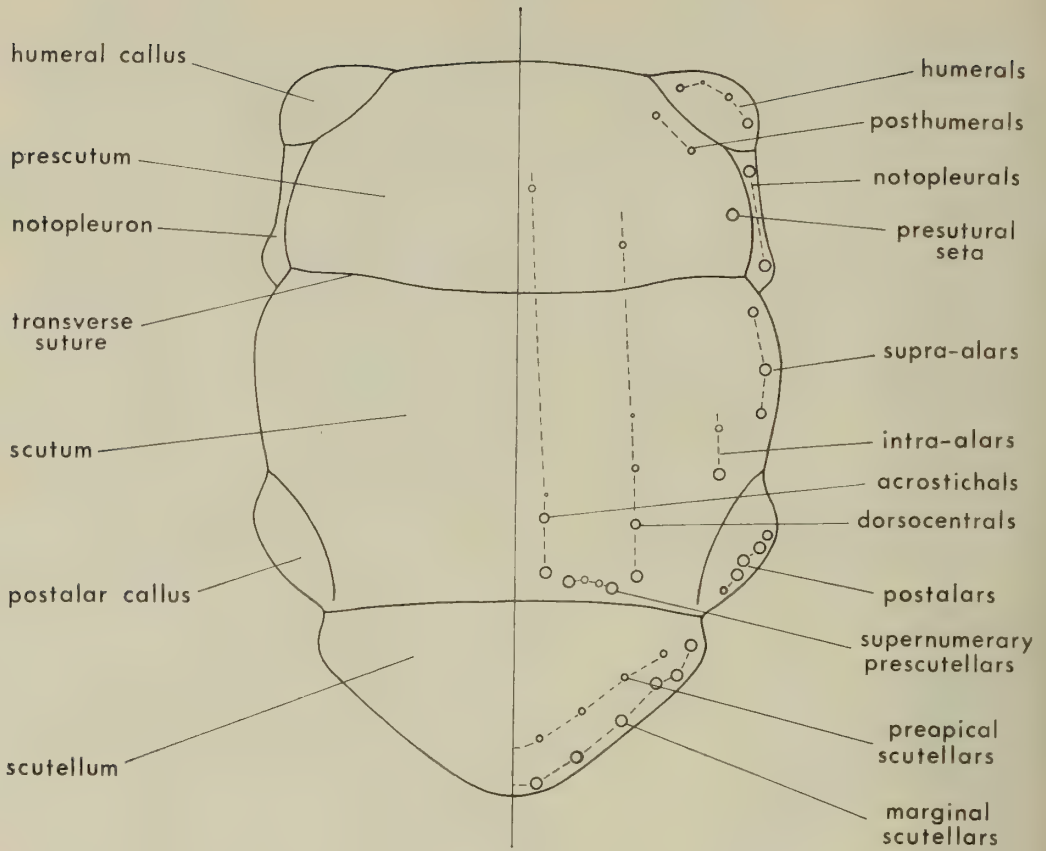


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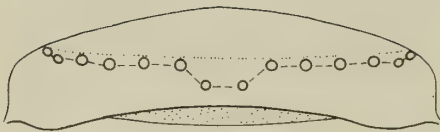


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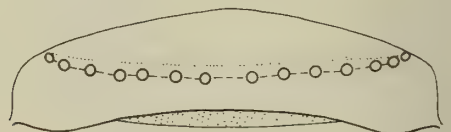
FIGS 4-8. Head profile, in outline only, of: 4, *Rutilia*, showing genal dilation (G.D.) reaching to a level with anteriormost point of eye. 5, *Rutilodexia*, showing feeble genal dilation not reaching forwards nearly as far as anteriormost point of eye. 6, *Chrysopa*, facial outline only. 7, *Prodiaphania*, showing strong development of gular region of head and short-plumose arista. 8, *Chetogaster*, facial outline only.



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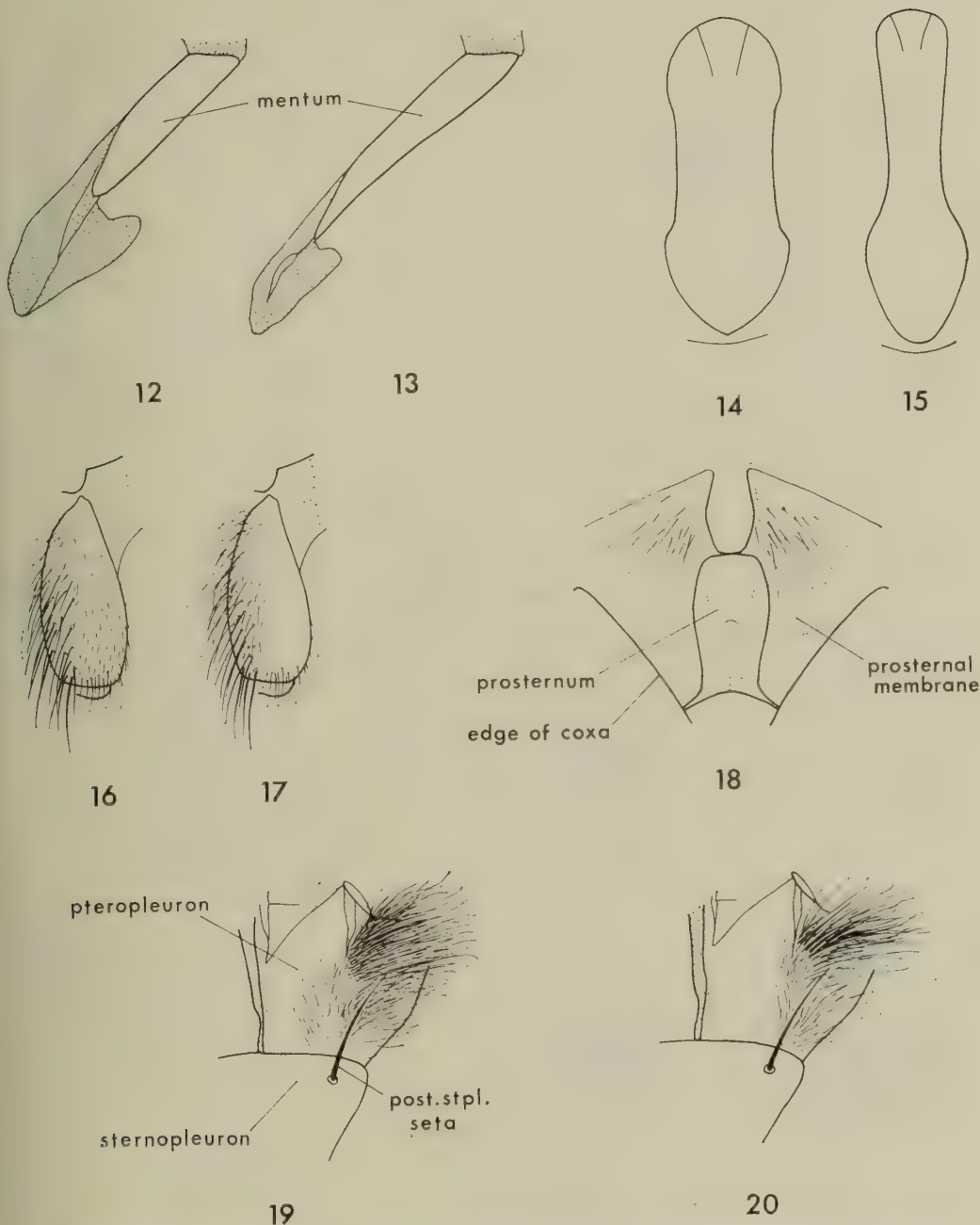


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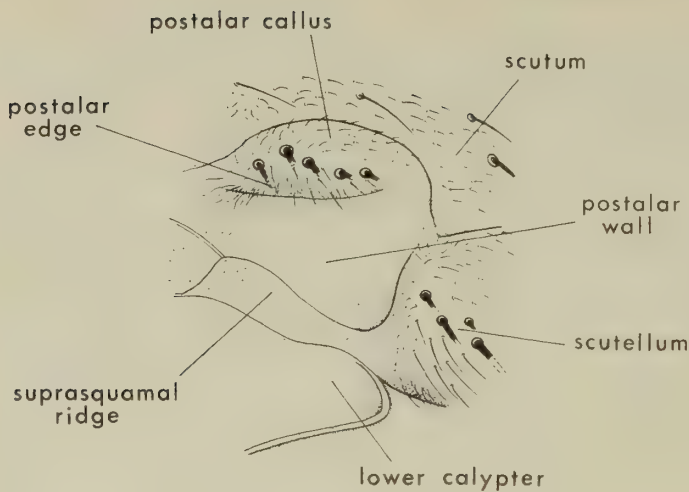


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FIGS 9-11. Thoracic dorsum of a Rutiline fly. 9, terminology of sclerites (left side of mid line) and chaetotaxy indicated by pores (right side of mid line). 10 & 11, posterior view of scutellum showing level of insertions of marginal scutellar setae in *Rutilia* (10) and *Formosia* (11). All figures schematic and relative bristle sizes indicated approximately by pore size shown (chaetotaxy very varied, forms may have more or fewer setae in any series than indicated or may lack some series completely: see discussion of taxonomic characters).



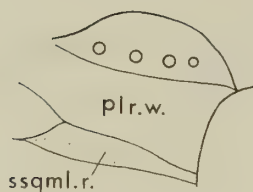
FIGS 12-20. Taxonomic characters used in the text. 12 & 13, two forms of proboscis found in Rutiliini: (12) mentum in profile with subparallel upper and lower edges, (13) mentum in profile distinctly tapering apically. 14 & 15, two forms of buccal opening (oral cavity) found in Rutiliini: (14) short broad buccal opening of most forms, (15) long narrow buccal opening of *Prodiaphania* and *Formodexia* (both drawn from females: buccal opening of males relatively slightly narrower in both types). 16 & 17, vestiture of inner anterior surface of fore coxa in (16) *Formosia* s. str. (almost whole surface haired) and in (17) other Rutiliini (bare on inner part). 18, hairing of prosternal membrane found in many forms. 19 & 20, extent of hairing on pteropleuron in (19) subgenera *Chrysorutilia* and *Ameniamima*, and (20) in other Rutiliini (hairing of sternopleuron omitted).



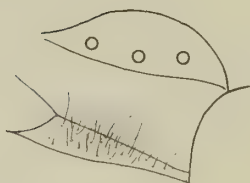
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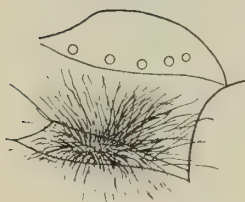
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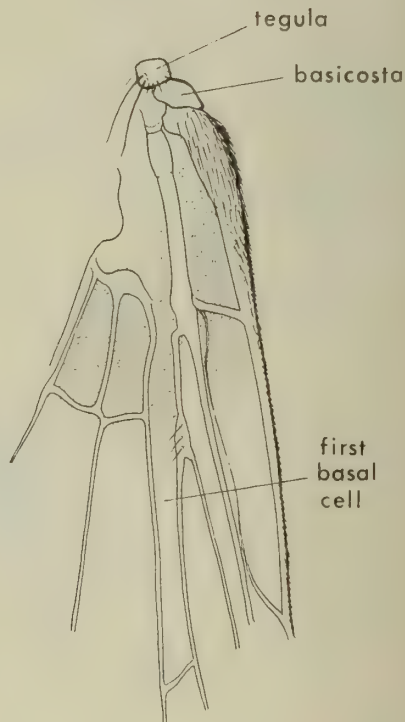
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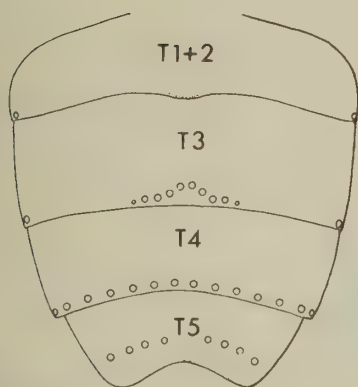


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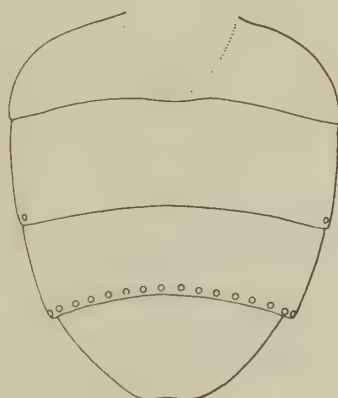


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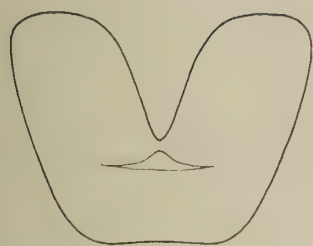
FIGS 21-27. Taxonomic characters used in the text. 21, postalar callus and surrounding structures. 22-25, vestiture of postalar wall and suprasquamal ridge in: 22, forms with both areas bare (e.g. *Prodiaphania*, *Rutilodexia*); 23, forms with sparse hairing only on suprasquamal ridge (e.g. subg. *Micro-rutilia*); 24, forms with very long dense hair on suprasquamal ridge (e.g. subg. *Chrysorutilia*, *Amphibolia*); 25, forms with dense hair tuft on postalar wall (*Formosia*, *Formodexia*). 26, strongly explanate costal base (e.g. *Prodiaphania*). 27, basal part of wing, showing long wiry setulae on tegula in most forms (shaded area indicates the sub-basal dark mark found on the wing of most *Rutiliini*).



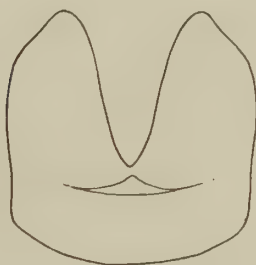
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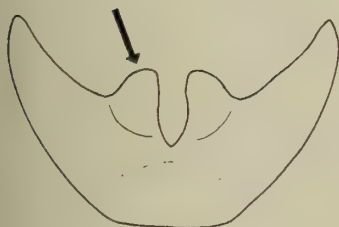
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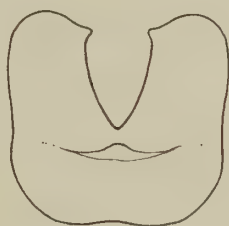
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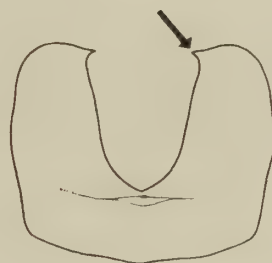
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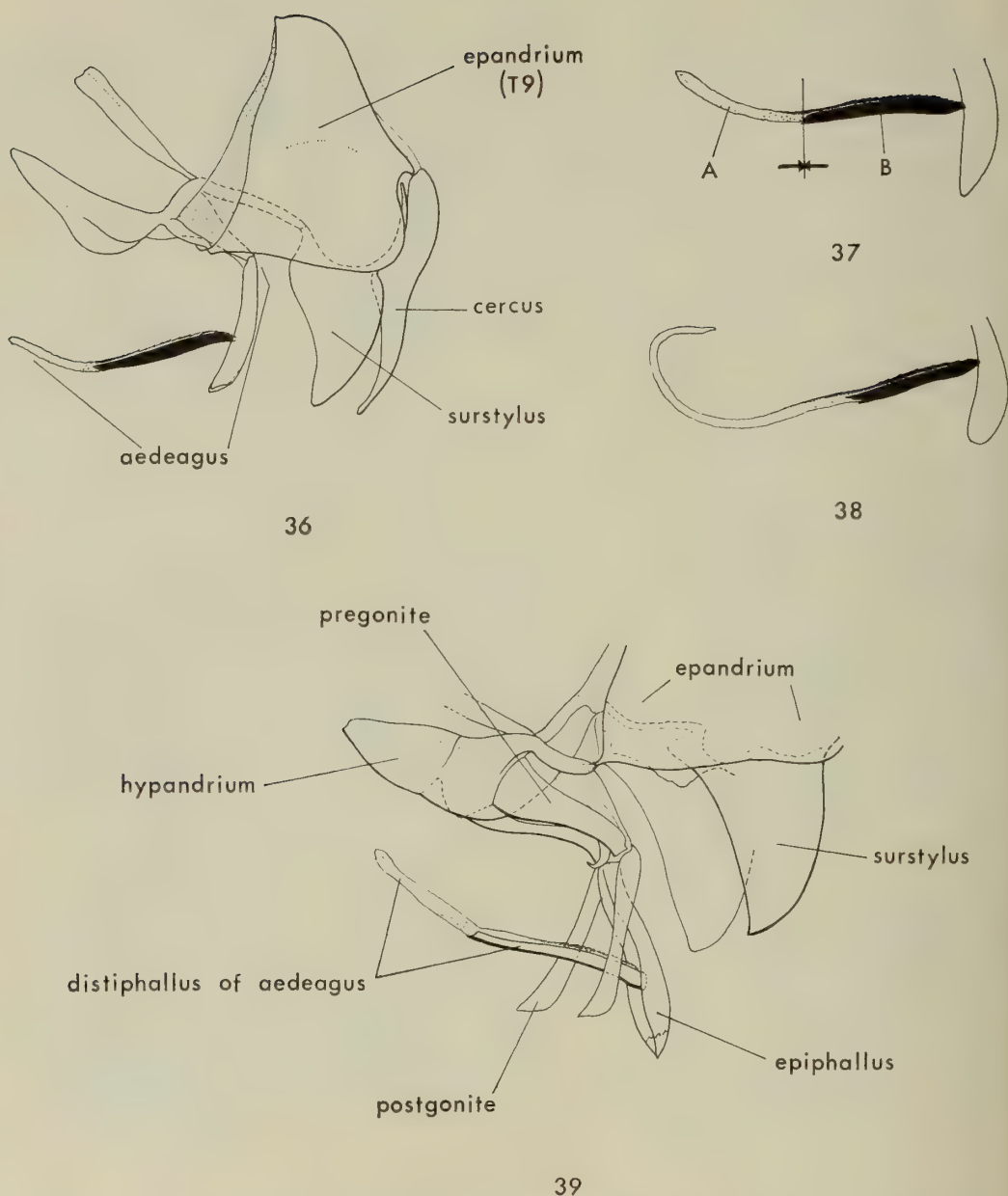


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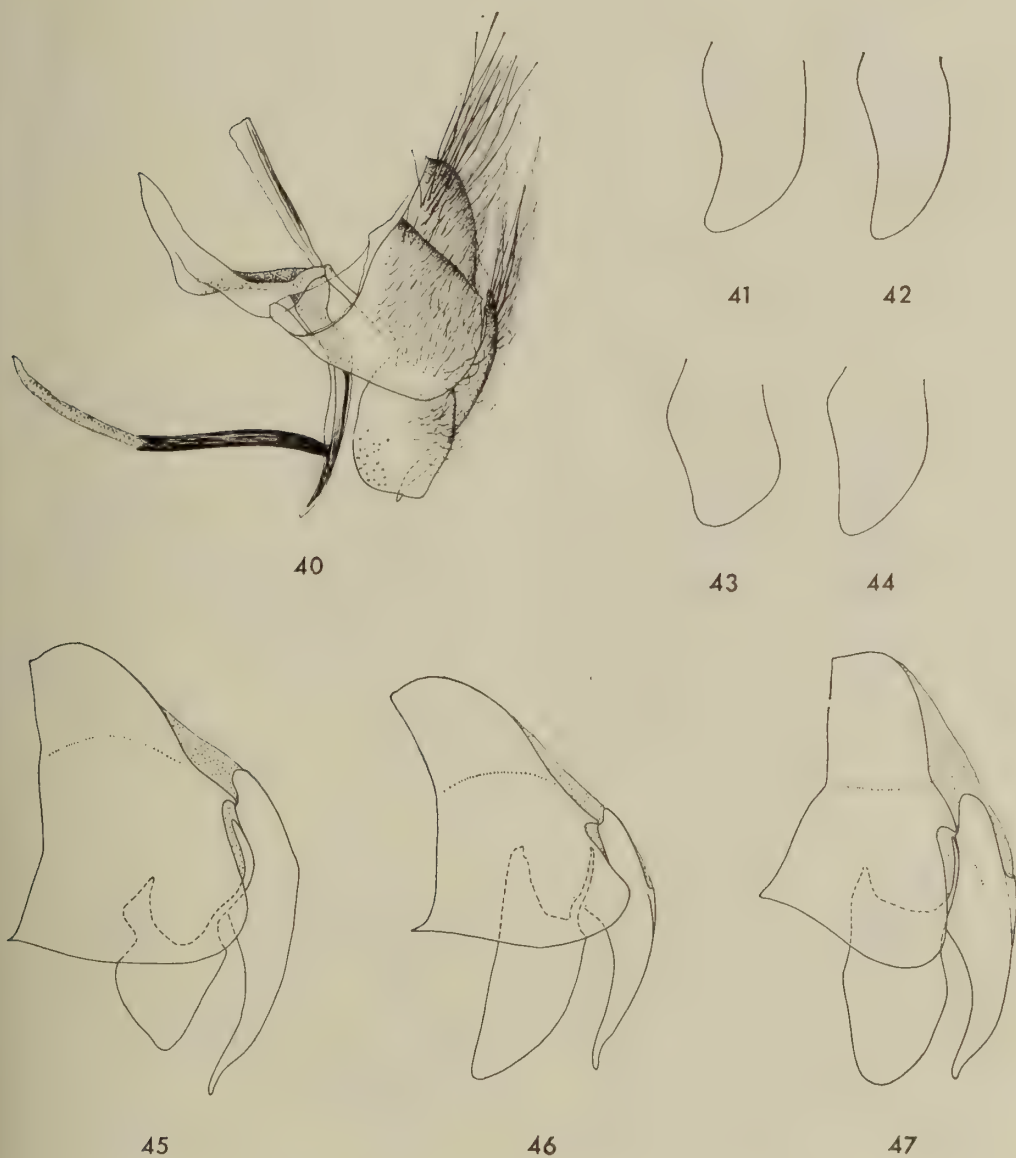


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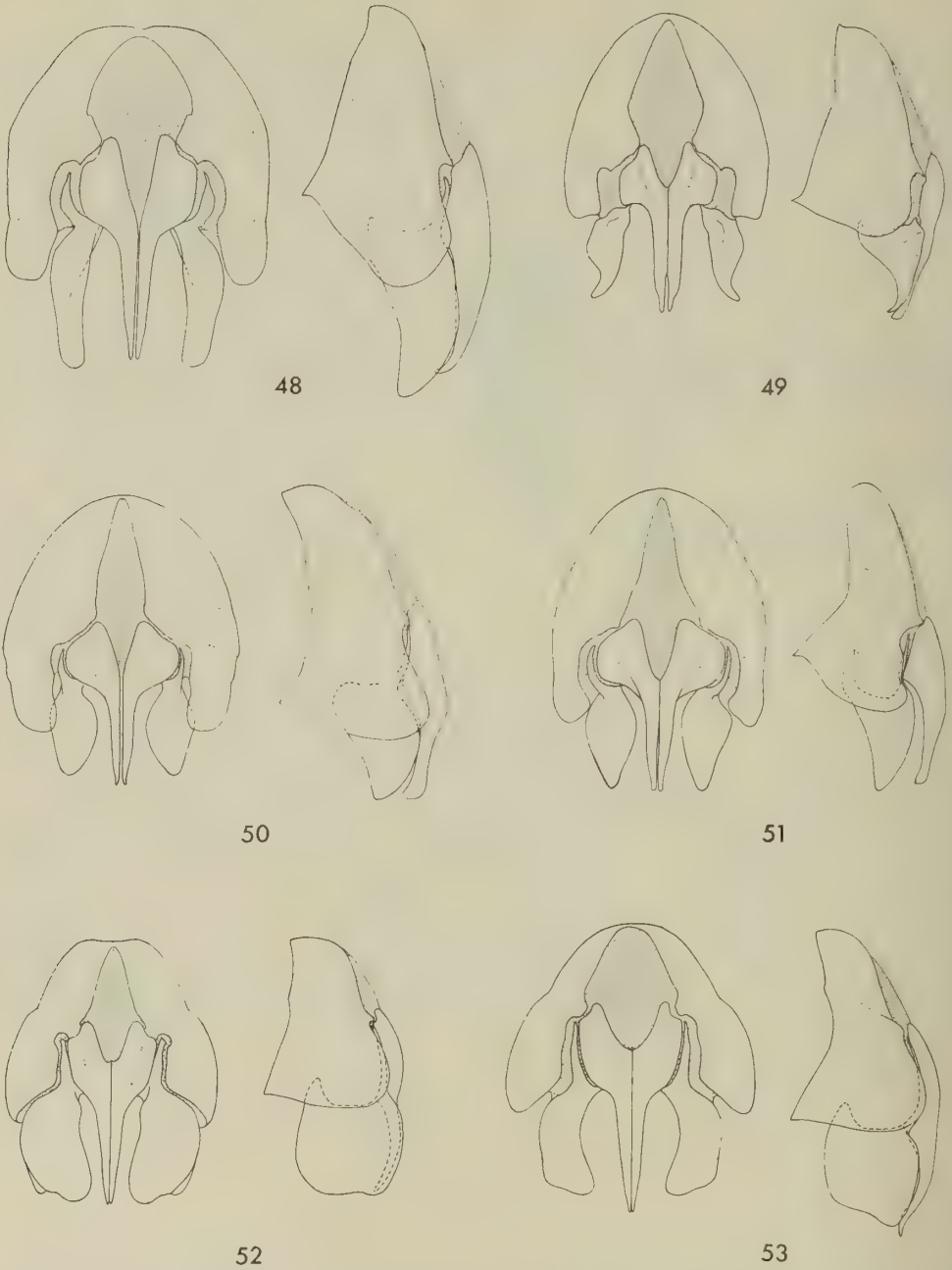
FIGS 28-35. Abdominal characters. 28 & 29, the two main forms of abdomen in Rutiliini with tergite numbering (pores indicate a typical chaetotaxy associated with each abdominal shape). 30-35, fifth abdominal sternite of ♂ in: 30 & 31, great majority of forms; 32, subgenus *Microvutilia*; 33, subgenus *Grapholostylum*; 34 and 35, the two species of subgenus *Paramphibolia* (34, *stolida*; 35, *assimilis*). Hairing omitted.



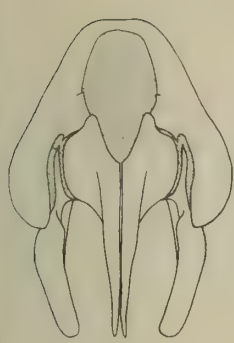
FIGS 36-39. Male genitalia of Rutiliini. 36, whole hypopygium in profile. 37 & 38, two forms of aedeagal distiphallus found in Rutiliini: (37) great majority of forms in which apical membranous part (A) is subequal in length to or shorter than basal sclerotized part (B), (38) form in subgenus *Grapholostylum* in which membranous apical part whip-like and nearly twice as long as sclerotized basal part. 39, aedeagus and associated structures viewed obliquely. All hairing omitted.



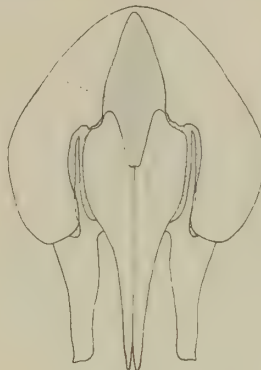
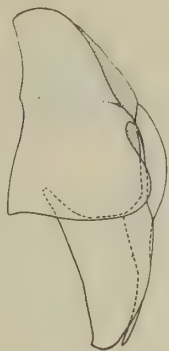
FIGS 40-47 Male genitalia in *Formosia* and *Chetogaster*. 40, complete hypopygium in profile of *Formosia fusca* sp. n. 41-44, range of shape in profile of the surstylus in *Formosia* s. str. 45-47, epandrium, cerci and surstyli in profile (hairing omitted) of *Chetogaster canberrae* (45), *C. oblonga* (46) and *C. violacea* (47).



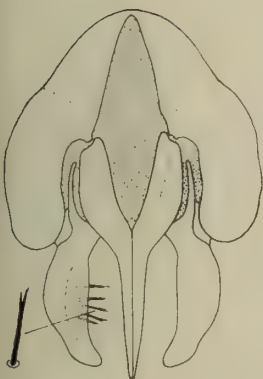
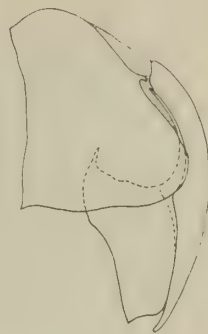
FIGS 48-53. Epandrium, cerci and surstyli of ♂ genitalia in *Formosia* s. l. Apical view (left) and profile (right). 48, *F. (F.) flavipennis*. 49, *F. (F.) viridiventris* sp. n. 50, *F. (Pseudoformosia) saturatissima*. 51, *F. (P.) excelsa*. 52, *F. (Euamphibolia) speciosa*. 53, *F. (E.) faceta*. Hairing omitted.



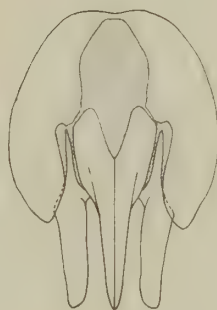
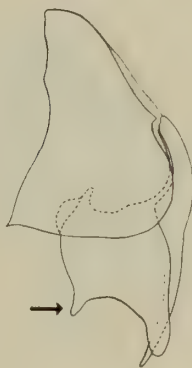
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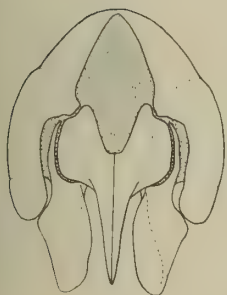
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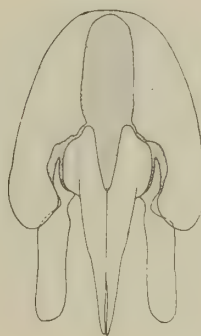
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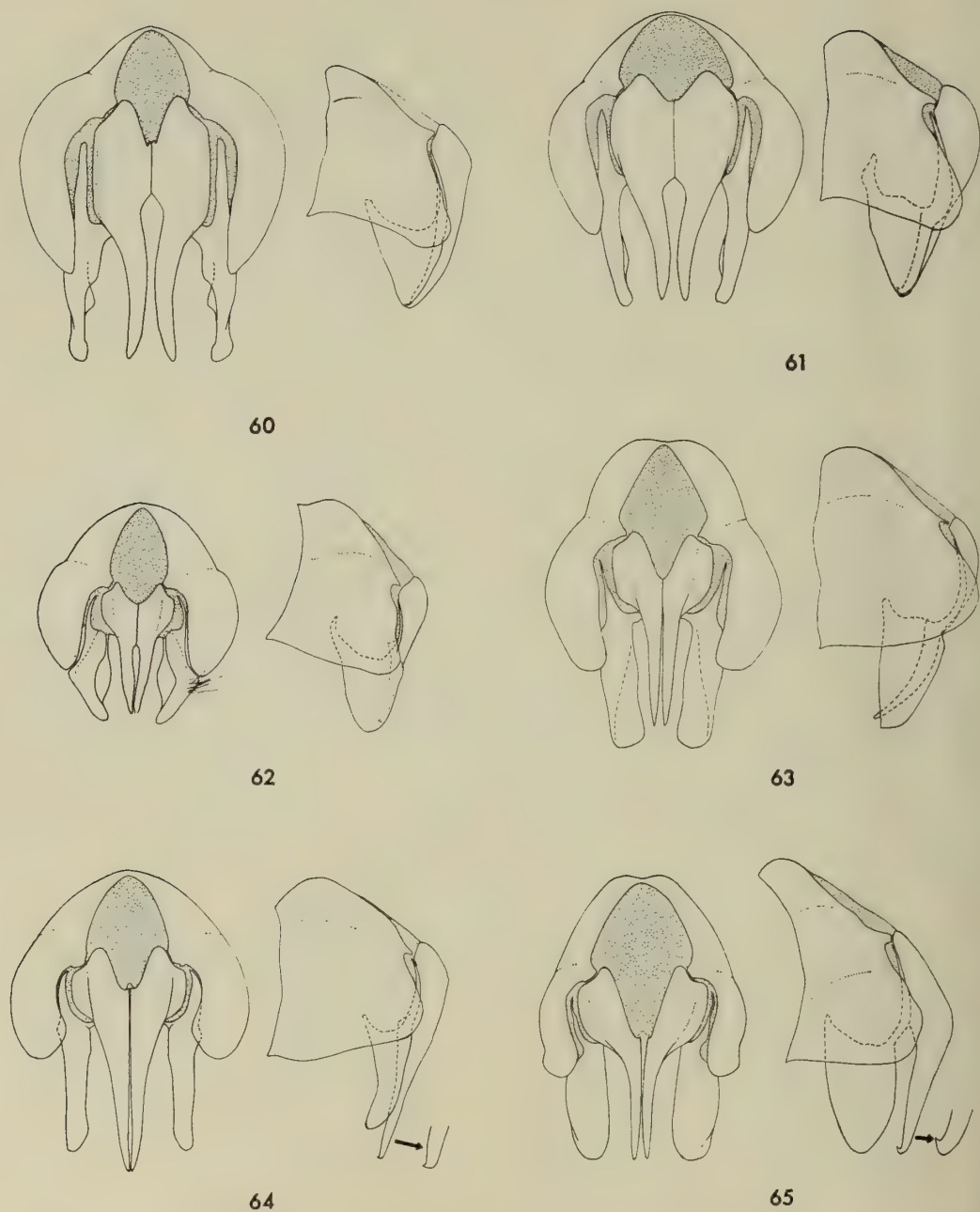
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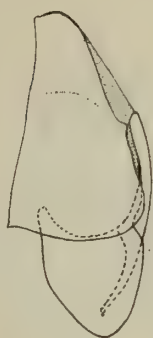
FIGS 54-59. Epandrium, cerci and surstyli of ♂ genitalia in *Rutilia* s. l. Apical view (left) and profile (right). 54, *R. (R.) vivipara*. 55, *R. (R.) confusa*. 56, *R. (R.) dentata* sp. n. 57, *R. (R.) setosa*. 58, *R. (Ameniamima) argentiifera*. 59, *R. (Neorutilia) simplex*. Hair-ing omitted.



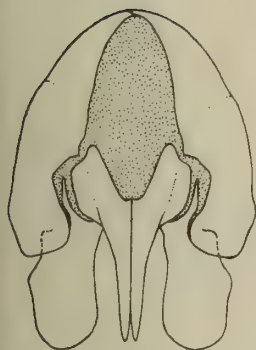
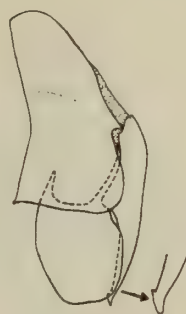
FIGS 60-65. Epandrium, cerci and surstyli of ♂ genitalia in *Rutilia* s. l. Apical view (left) and profile (right). 60, *R. (Microrutilia) media*. 61, *R. (M.) nigripes*. 62, *R. (M.) minor*. 63, *R. (M.) hirticeps*. 64, *R. (Grapholostylum) dorsomaculata*. 65, *R. (Donovanius) agalmiodes*. Hairing omitted, except for tuft on surstylus of *minor*.



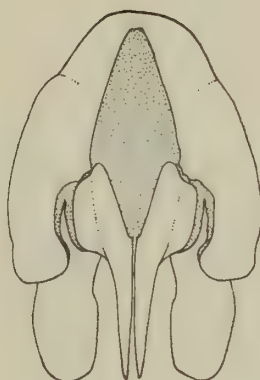
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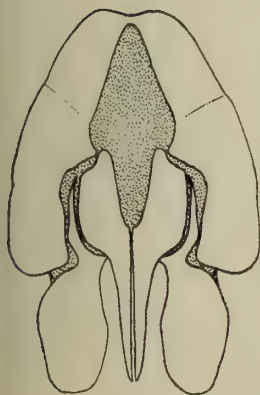
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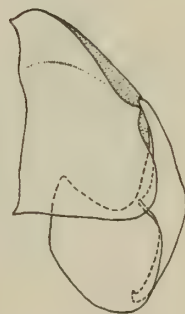
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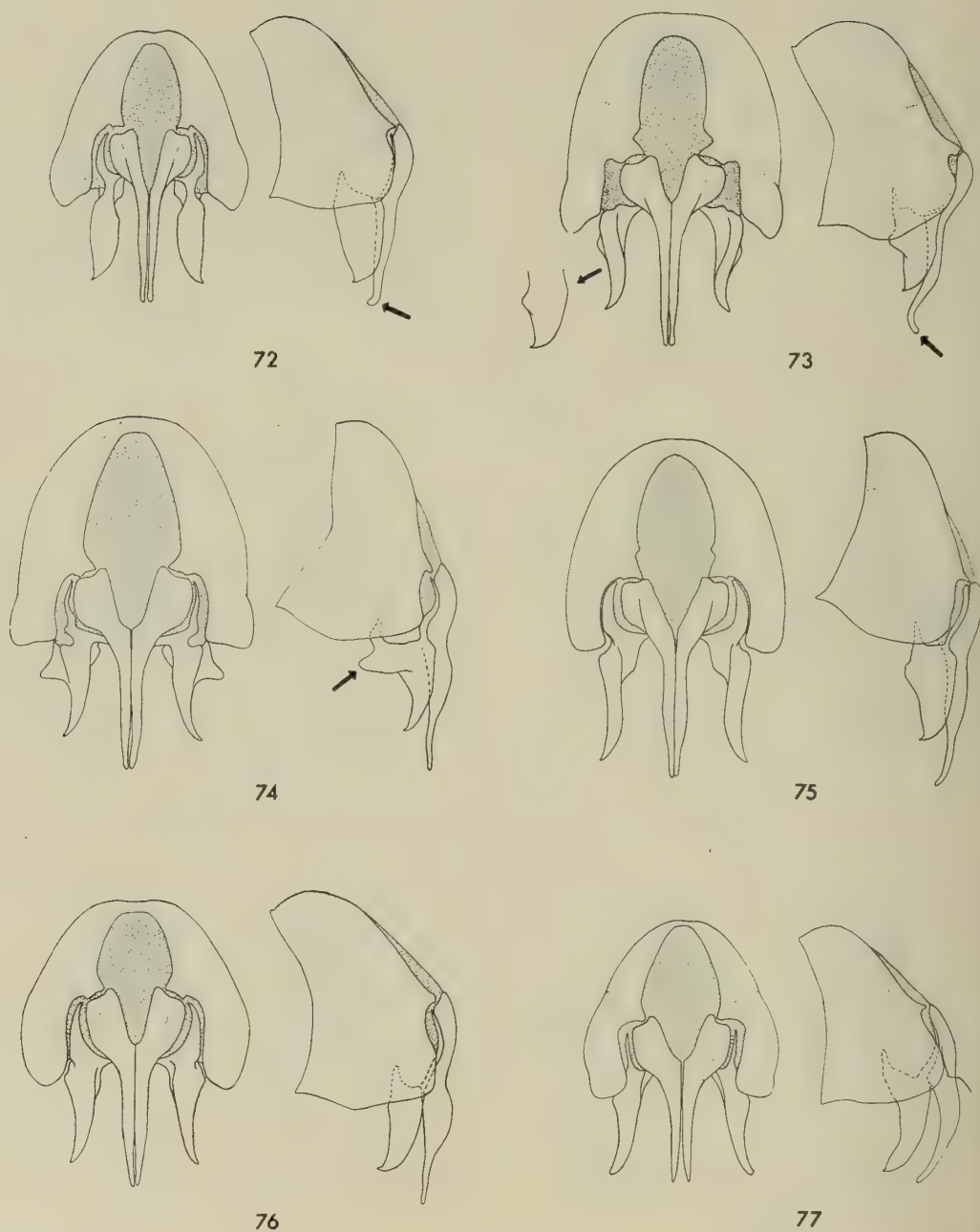
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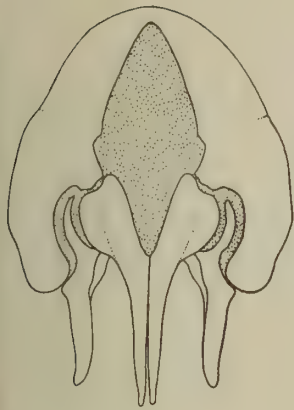
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FIGS 66-71. Epandrium, cerci and surstyli of ♂ genitalia in subgenus *Donovanius*. Apical view (left) and profile (right). 66, *R. (D.) pellucens*. 67, *R. (D.) analoga*. 68, *R. (D.) sabrata*. 69, *R. (D.) inusta*. 70, *R. (D.) regalis*. 71, *R. (D.) lepida*. Hairing omitted.



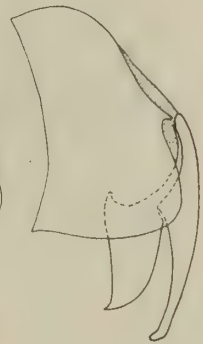
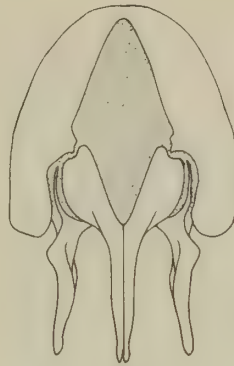
FIGS 72-77. Epandrium, cerci and surstyli of ♂ genitalia in subgenus *Chrysorutilia*. Apical view (left) and profile (right). 72, *R. (C.) splendida*. 73, *R. (C.) decora*. 74, *R. (C.) cryptica* sp. n. 75, *R. (C.) imperialis*. 76, *R. (C.) imperialoides* sp. n. 77, *R. (C.) idesa*. Hairing omitted.



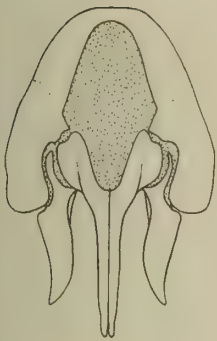
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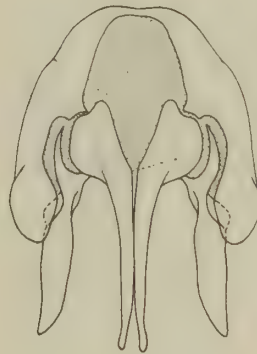
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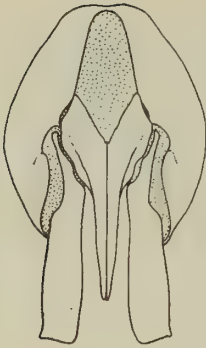
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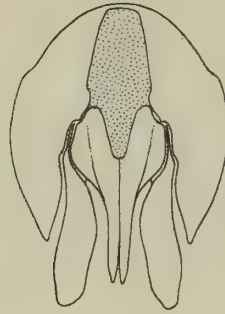
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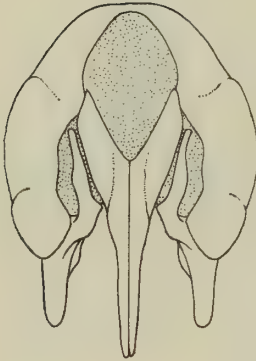
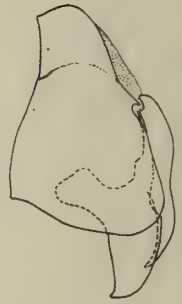
FIGS 78-84. Epandrium, cerci and surstyli of ♂ genitalia in subgenus *Chrysorutilia*. Apical view (left) and profile (right), and profile shape of surstylus only for some species. 78, *R. (C.) rubriceps*. 79, *R. (C.) caeruleata*. 80, *R. (C.) panthea*. 81, *R. (C.) formosa*. 82, *R. (C.) transversa*, profile of surstylus. 83, *R. (C.) caesia*, profile of surstylus. 84, *R. (C.) chersipho*, profile of surstylus. Hairing omitted.



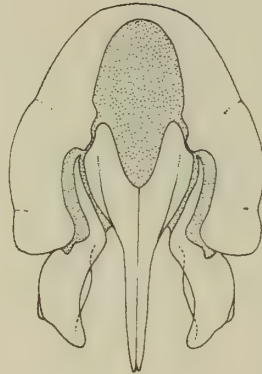
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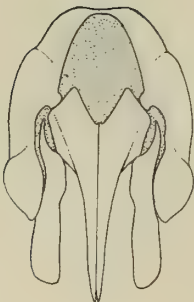
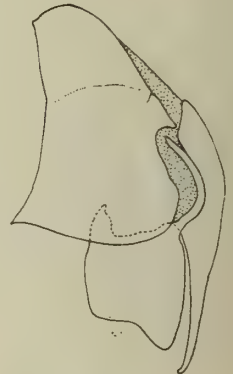
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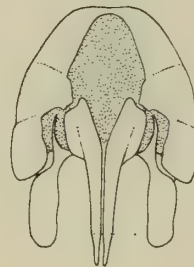
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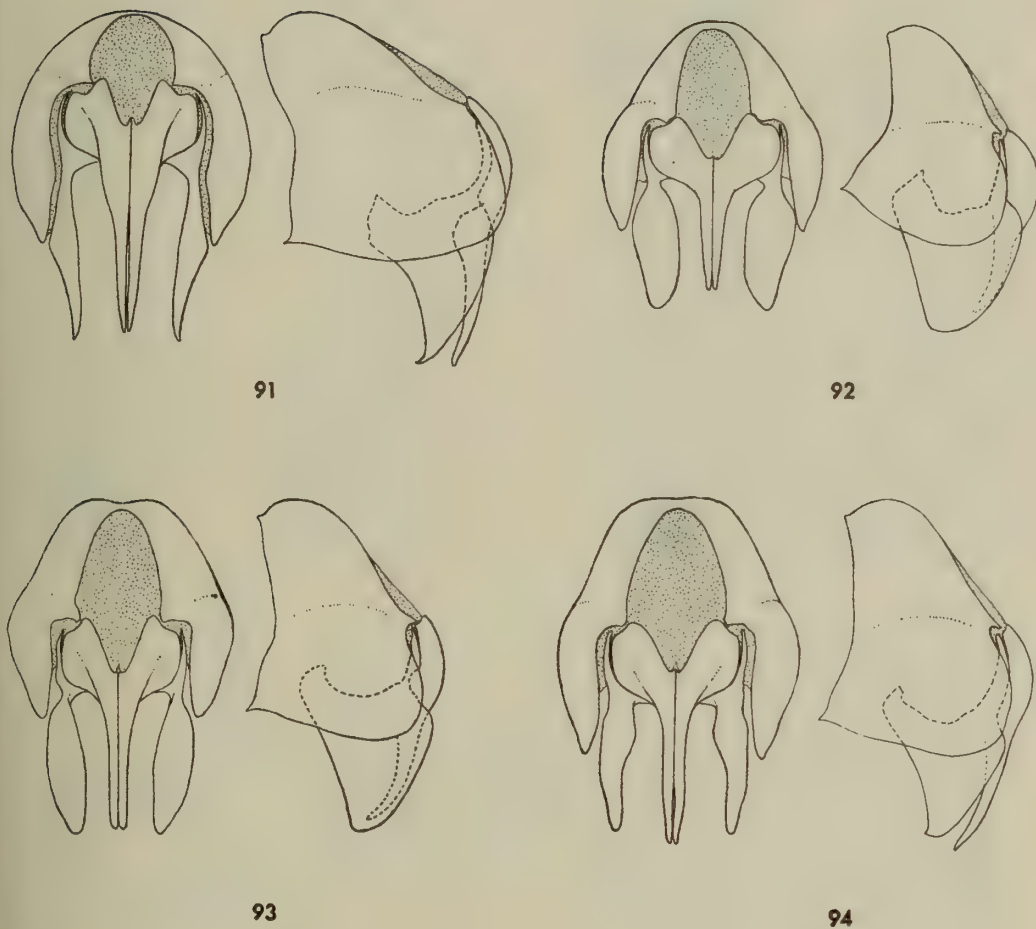
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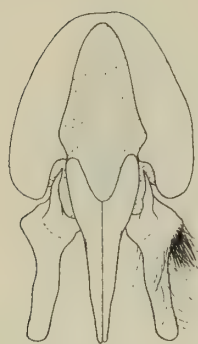
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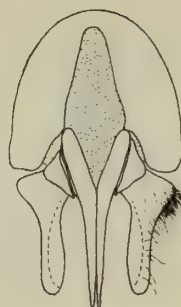
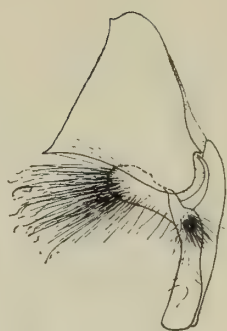
FIGS 85-90. Epandrium, cerci and surstyli of ♂ genitalia in *Amphibolia* and *Rutilodexia*. Apical view (left) and profile (right). 85, *A. (Paramphibolia) assimilis*. 86, *A. (P.) stolidia*. 87, *A. (Amphibolia) ignorata*. 88, *A. (A.) valentina*. 89, *A. (A.) campbelli*. 90, *Rutilodexia ? papua*. Hairing omitted.



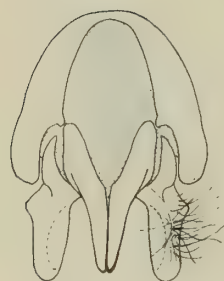
FIGS 91-94. Epandrium, cerci and surstyli of ♂ genitalia in the genus *Chrysopasta*. Apical view (left) and profile (right). 91, specimen from Newdegate, W.A. 92, specimen from 6 miles north of Watheroo, W.A. 93, holotype of *elegans* Macquart, locality unknown. 94, lectotype of *zabirna* Walker, Perth, W.A. (See text for discussion of variability.) Hairing omitted.



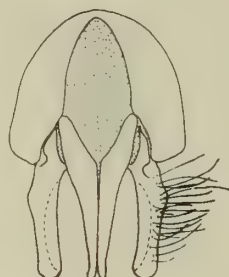
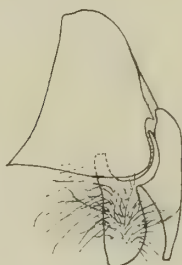
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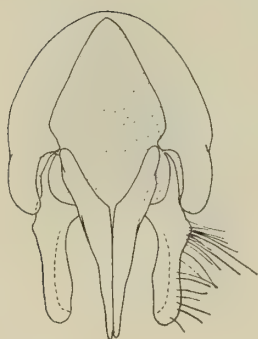
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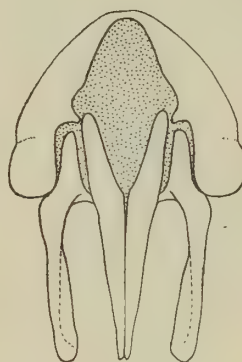
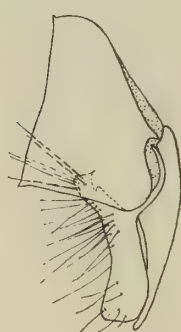
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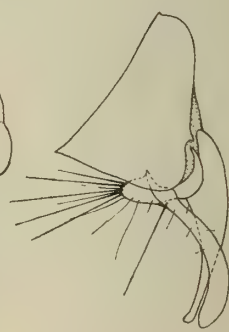
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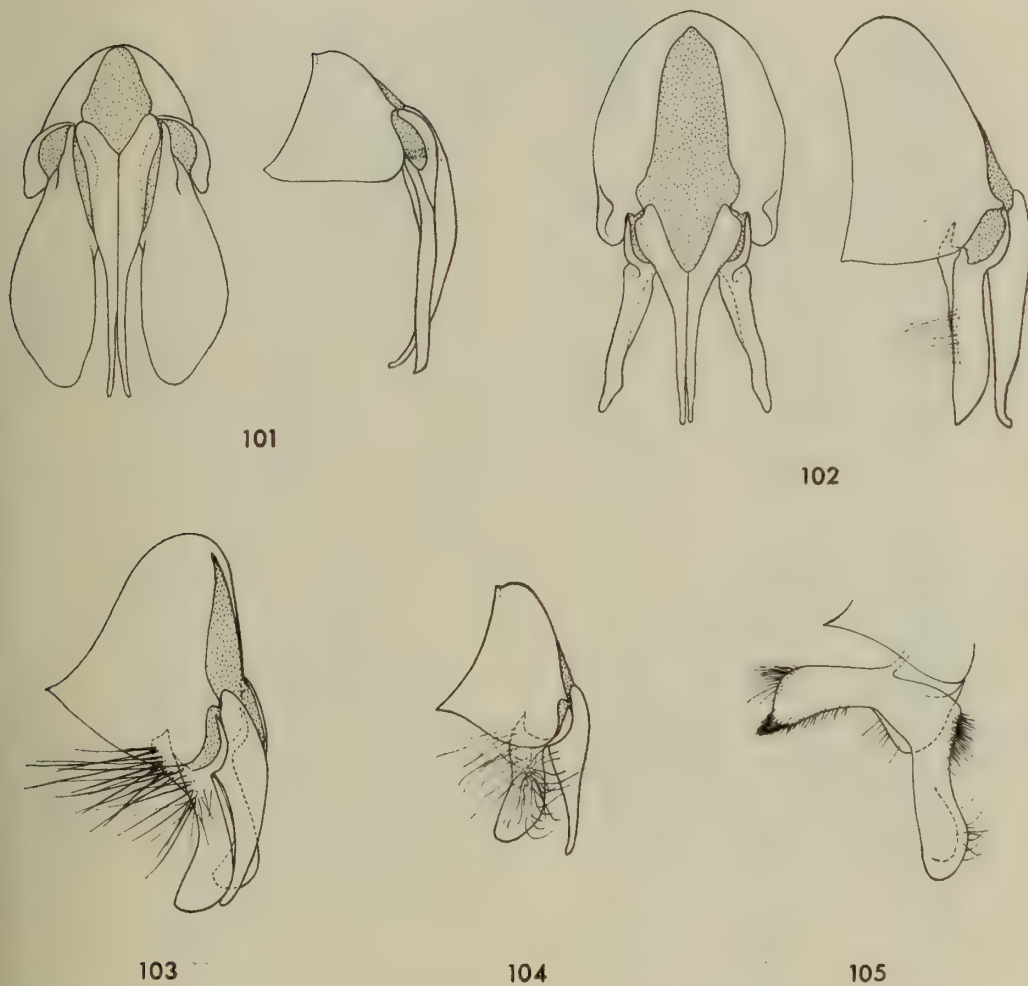
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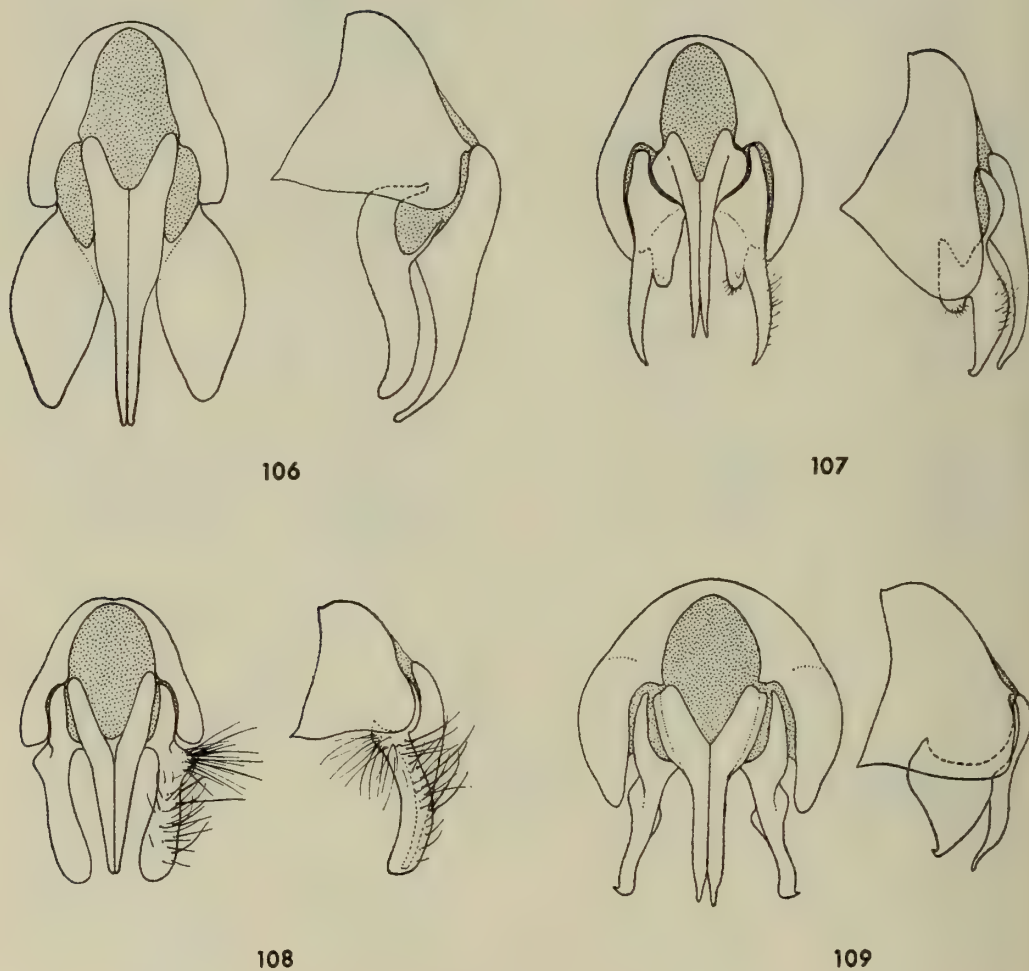
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FIGS 95-100. Epandrium, cerci and surstyli of ♂ genitalia in *Prodiaphania*. Apical view (left) and profile (right). 95, *P. testacea*. 96, *P. furcata*. 97, *P. minuta*. 98, *P. arida*. 99, *P. fullerae*. 100, *P. genialis*. Main hairing only shown.



FIGS 101-105. Epandrium, cerci and surstyli of ♂ genitalia in *Prodiaphania*. 101, *P. georgei*, apical view and profile. 102, *P. victoriae*, apical view and profile. 103, *P. funebris*, semi-profile (drawn from old slide mount of ♂ genitalia of paratype specimen in which hypopygium not mounted exactly in profile). 104, *P. deserta*, profile. 105, *P. furcata*, surstylus only in profile.



FIGS 106-109. Epandrium, cerci and surstyli of ♂ genitalia in *Prodiaphania* and *Rutilia*. Apical view (left) and profile (right). 106, *P. biarmata*. 107, *P. cygnus*. 108, *P. regina*. 109, *Rutilia (Microrutilia) nigriceps*.



MAP. Geographical distribution of the tribe Rutiliini. Known distribution solid black, suspected distribution stippled. Samoa represents the furthest eastwards extent of the tribal range.

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A RECLASSIFICATION  
OF THE SUBFAMILY AGRYPNINAE  
(COLEOPTERA: ELATERIDAE)



C. M. F. VON HAYEK

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# A RECLASSIFICATION OF THE SUBFAMILY AGRYPNINAE (COLEOPTERA: ELATERIDAE)

By CHRISTINE MARIA FELICITAS VON HAYEK

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## SYNOPSIS

The characters until now used to separate the genera of Agrypninae are reviewed and evaluated and the use of new and previously neglected characters is proposed. The type-material of the type-species of every genus except *Adelocera* was located and examined. The genera are redefined on the basis of the new characters. A key to the genera is provided.

The diagnostic features of the type-species of *Adelocera* are deduced from the lectotype of another species, shown, from a study of the literature and other evidence, to be conspecific with it.

Eight hundred and ninety-five of the nominal species included in the Agrypninae by previous workers are evaluated and each is assigned to an appropriate genus. Four hundred and seventy-one new combinations are proposed. Thirty-five generic and 23 specific names are newly placed in synonymy. One generic and 11 specific names are extracted from synonymy. The location of the type-material (holotypes and syntype-series) of 115 species is recorded and 406 lectotypes are newly designated.

## INTRODUCTION

THE Elateridae considered in this work are those comprising the Agrypninae of the Schenkling Catalogue (1925), with the exception of *Anaspasis* (see p. 5), and those subsequently described as belonging or related to the genera in this subfamily. The genus *Octocryptus* is included as a matter of convenience as the species bear a superficial but close resemblance to certain Agrypninae.

The category subfamily is adopted for the group principally because it is the one used in the most recent practical key to the Elateridae of the world (Fleutiaux, 1941a : 36). Other workers have treated the same group of species as a tribe (Agrypnini Schwarz, 1906, Adelocerini Arnett, 1969), subtribe (Agrypnina Hyslop, 1917 : 236) or intermediate group (Agrypnitae Fleutiaux, 1941c).

Recent years have seen the establishment of a number of new genera and subgenera belonging to the Agrypninae. A study of the literature has shown that in almost every case the diagnosis of the old established and new genera and subgenera are little more than brief summaries of the most conspicuous features of the type-species. In very few cases only are there any indications of the range of variation which may be found within the genus or any effort made to define its limits. Attempts to identify material has shown that many species cannot be accommodated satisfactorily in any genus as at present defined, while others can be placed equally well in two or more genera.

This unsatisfactory state of affairs suggests that the characters until now used for the separation of the genera display a greater degree of variation than has been hitherto suspected. The reason why this has only now become apparent is that both past and present workers have based their studies on restricted faunas and shown little or no interest in the relationship of the species considered in their works with those found in other regions. In addition, workers have continued to use the same classic characteristics for the separation of the genera as their predecessors over a hundred years ago, and almost no attempt has been made to evaluate these characters at the generic level or to discover new ones.

THE CLASSIC CHARACTERS USED  
FOR THE SEPARATION OF THE GENERA

The characters until now used for the separation of the genera have been the length and depth of the tarsal grooves, the appearance of the surface and lateral margins of the prothorax and elytra, the form of the mesosternal groove, the length of the antennae and of the femora of the middle legs and the structure of the fourth tarsal segment.

Examination of a great deal of material in the British Museum (Natural History), the Muséum National d'Histoire Naturelle, Paris, the Institut Royal des Sciences Naturelles de Belgique, Brussels, and other collections has shown that the degree to which these characteristics are developed varies from one species to another and sometimes from one individual to another and also that they occur in such varied combinations that they are of no value at the generic level. However the present investigation and a study of the literature has led to the discovery of new

and previously neglected characteristics which are of considerable importance at the generic level.

THE CHARACTERS USED FOR THE  
SEPARATION OF THE GENERA IN THE PRESENT WORK

The most important of the characters used in the present work is the structure of the middle coxal cavity. Thomson (1864 : 59, 1868 : 91), Schiodte (1865 : 497) and more recently Nakane & Kishii (1956 : 202, 203) were aware that this character was of some importance, but as Kontkanen (1964 : 48) comments, it has been completely forgotten by taxonomists. The other main characteristics are the size and shape of the second and third antennal segments, the presence or absence of tibial spurs, the position of the propleural grooves for the reception of the tarsi in relation to the antennal groove and of the distal end of the metasternal groove for the reception of the tarsi in relation to the margin of the metasternum.

NOTES ON THE KEY TO GENERA AND SUBGENERA

With the aid of the following key there should be no difficulty in assigning to the appropriate genus, as defined in this paper, all species listed in the subfamily Agrypninae in the Schenkling (1925) catalogue, with the exception of those belonging to the genus *Anaspasis* (see below), and any Agrypnine species described after the publication of the catalogue.

With one exception (*Elater ovalis* Germar – see below) the characters used in the key have been observed in the holotype or lectotype specimen of the type-species of each genus. In only one case (that of *Elater ovalis* Germar, the type-species of *Adelocera*) did the search for the type-material or indeed any determined material prove completely unsuccessful. In this case the generic characters are drawn from the lectotype of another species, *Lacon occidentalis* Candèze, shown later in the present work (p. 21) to be congeneric with, and very similar in appearance to, *ovalis* Germar.

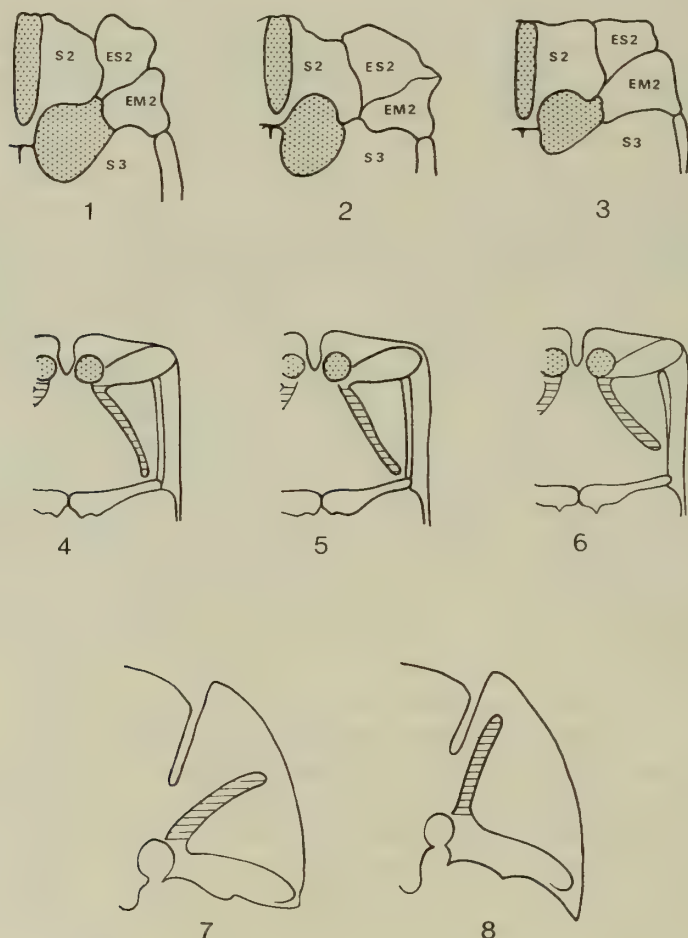
*Anaspasis* Candèze (1882 : 4) was excluded from the Agrypnitae [sic] by Fleutiaux (1941c : 48) because of the strong resemblance it bears to *Protelater* Sharp (1877). Golbach (1953 : 278) is in agreement with Fleutiaux. Examination of the type-species of the two genera, *Protelater elongatus* Sharp (1877 : 482) and *Anaspasis fasciolata* Candèze (1882 : 5), has shown that Fleutiaux was fully justified in his action. Both species differ from all Agrypnine genera in the shape of the frons and the absence of an antennal groove occupying a position corresponding to the whole or part of the length of the prosternopleural suture. In addition they lack setae at the base of the claws and possess tibial spurs. Crowson (1961 : 160) discusses the apparent affinities of *Protelater* but the true relationships of this and certain other genera, including *Anaspasis*, have yet to be discovered.

Fleutiaux (1907b : 170) included the monobasic genus *Anius* Candèze (1889) in the 'Agrypnides' but omits it without comment from his key to the Agrypnitae (Fleutiaux, 1941c). The type-material of the type-species, *gracillimus* Candèze, was received on loan shortly before this paper was submitted for publication. The inclusion of the species in the Agrypninae has been confirmed but further

studies of additional material (when this becomes available) are required before its relationships with other species can be elucidated.

# KEY TO GENERA AND SUBGENERA

- 1 Propleurae with longitudinal grooves near the lateral margin for the accommodation of the antennae. Posterior portion of prosternopleural suture grooved for the reception of the anterior tarsi . . . . . **OCTOCRYPTUS** Candèze (p. 266)
- Propleurae without longitudinal grooves near the lateral margin for the accommodation of the antennae. Prosternopleural suture never modified for the reception of the tarsi . . . . . 2



FIGS 1-8 Figs 1-3. Mesocoxal cavity and adjacent area. 1. *Lanelater* sp. 2. *Agrypnus* sp. 3. *Adelocera* sp. Figs 4-6. Meso- and metasternal area, left middle leg removed. 4. *Opatelus* sp. 5. *Agrypnus* sp. 6. *Adelocera* sp. Figs 7-8. Left side of prosternum and propleuron, front leg removed. 7. *Agrypnus* sp. 8. *Adelocera* sp. All figures are diagrammatic and are not drawn to the same scale. Mesosternal groove and mesocoxal cavities stippled, tarsal grooves cross-hatched. EM2, mesepimeron. ES2, mesepisternum. S2, mesosternum. S3, metasternum.

- 2 Mesepisternum forming part of margin of middle coxal cavity (Text-fig. 1). Tibial spurs present (Text-fig. 9). Vestiture setose, scales entirely absent

**LANELATER** Arnett (p. 240)

- Mesepisternum not forming part of margin of middle coxal cavity (Text-figs 2 & 3).

Tibial spurs absent (Text-fig. 10). Vestiture generally scaly . . . . . 3

- 3 Mesepimeron not forming part of margin of mesocoxal cavity (Text-fig. 2) . . . . . 4

- Mesepimeron forming part of margin of mesocoxal cavity (Text-fig. 3) . . . . . 8

- 4 Tarsal segments 1–4 expanded laterally (Text-fig. 17) . . . . . **TRIERS** Candèze (p. 239)

- Tarsal segments 1–4 not expanded laterally (Text-figs 15 & 16) . . . . . 5

- 5 Small species, less than 5 mm long. Prothorax constricted immediately behind the anterior angles. Lateral carina not attaining the anterior margin of the prothorax

**RISMETHUS** Fleutiaux (p. 235)

- Larger species or, if less than 5 mm long, the prothorax not constricted behind the anterior angles and lateral carina attaining the anterior margin of the prothorax . . . . . 6

- 6 Scutellum with longitudinal carina . . . . . 7

- Scutellum simple, without carina . . . . . **AGRYPNUS** Eschscholtz (p. 113)

- 7 Propleurae without tarsal grooves . . . . . **MERISTHUS** Candèze s. str. (p. 231)

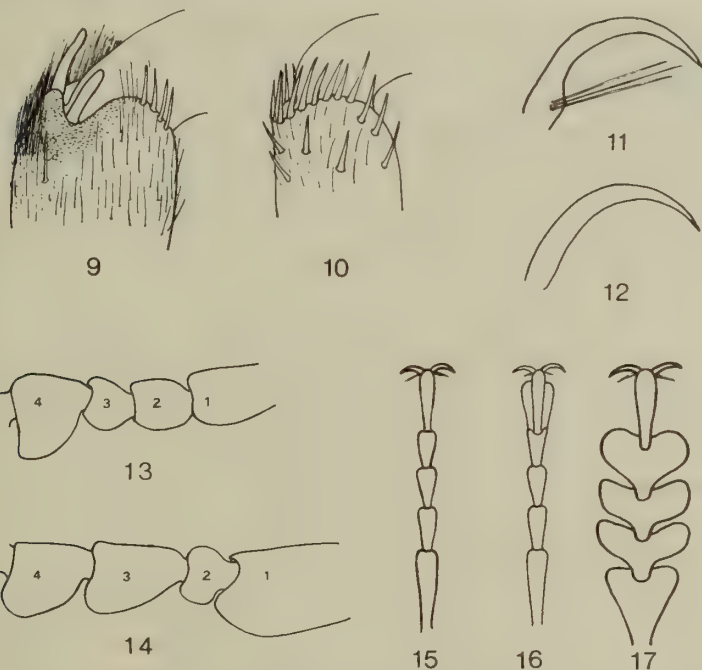
- Propleurae with tarsal grooves

**MERISTHUS** subgenus **SULCIMERUS** Fleutiaux (p. 231)

- 8 Claws without basal setae (Text-fig. 12) . . . . . **DANOSOMA** Thomson (p. 87)

- Claws with basal setae (Text-fig. 13) . . . . . 9

- 9 Second and third antennal segments subequal (Text-fig. 13). If the third is triangular and larger than the second, then propleural tarsal grooves are present and run parallel to the antennal grooves . . . . . 10



FIGS 9–17. Fig. 9. *Lanelater* sp., apex of tibia, pubescence partially removed. Fig. 10. *Agrypnus* sp., apex of tibia. Fig. 11. *Agrypnus* sp. claw. Fig. 12. *Danosoma* sp., claw. Figs 13–14. Antennal segments one to four. 13. *Agrypnus* sp. 14. *Lacon* sp. Figs 15–17. Tarsal segments. 15. *Agrypnus* sp. 16. *Agrypnus* sp. 17. *Triers ramitarsus* Candèze.

- Second and third antennal segments not subequal (Text-fig. 14). The third segment as long as the fourth but sometimes of a different shape . . . . . 12
- 10 Propleurae and metasternum with well defined grooves for the reception of the tarsi. Metasternal grooves directed posteriorly; the distal end of these grooves, if produced, would cut the posterior margin of the metasternum (Text-fig. 4) **OPATELUS** Candèze (p. 91)
- Propleurae and metasternum with or without grooves or depressions for the reception of the tarsi. Metasternal tarsal grooves or depressions, if present, directed laterally; the distal end, if produced, would cut the lateral margin of the metasternum at a point at or within the anterior three-quarters of its length (Text-fig. 6) . . . . . 11
- 11 Lateral margins of pronotum with a band of closely packed scales **SCAPHODERUS** Candèze (p. 51)
- Lateral margins of pronotum without a band of closely packed scales **ADELOCERA** Latreille (p. 13)
- 12 Tarsal segments without ventral lobes (Text-fig. 15) . . . . . 13
- One or more tarsal segments with ventral lobes (Text-fig. 16) . . . . . 15
- 13 Lateral margins of prothorax not carinate . . . . . **EIDOLUS** Candèze (p. 190)
- Lateral margins of prothorax carinate . . . . . 14
- 14 Posterior prosternal process directed upwards immediately behind the anterior coxae **CANDANIUS** nom. n. (olim **Anius** Candèze) (p. 85)
- Posterior prosternal process not directed upwards immediately behind the anterior coxae . . . . . **LACON** Castelnau (p. 52)
- 15 Abdomen with grooves for the reception of the hind tarsi **ACROCRYPTUS** Candèze (p. 92)
- Abdomen without grooves for the reception of the hind tarsi . . . . . 16
- 16 African species. Antennal groove not extending beyond the anterior half of the prosternopleural suture . . . . . 17
- American and Indonesian species. Prothoracic antennal groove extending beyond the anterior half of the prosternopleural suture **DILOBITARSUS** Latreille (p. 93)
- 17 Prothorax cylindrical. Head with a pair of tubercles directed anteriorly. Frons not margined anteriorly . . . . . **ELASMOSOMUS** Candèze (p. 101)
- Prothorax not cylindrical. Head without tubercles. Frons margined anteriorly **HEMICLEUS** Candèze (p. 108)

#### THE ASSIGNMENT OF SPECIES TO GENERA

The major part of this work is concerned with the assignment of each Agrypnine species known to me to the appropriate genus. It also provides a record of the present location of the type-material of the majority of these species.

With a few exceptions, generic assignments have been made only for those species known to me from examinations of the holotype, paratype, lectotype or syntype material, or specimens whose identification labels or provenance leads me to believe that they are correctly identified.

The generic assignment of species by means of diagnostic characters unknown to earlier workers, renders it impossible to make generic assignments for the majority of species known to me only from the description. In the few cases in which the describer has recorded characters of secondary importance, such as the position of the propleural tarsal grooves, a generic assignment has been made. Generic assignments based on descriptions must be regarded as tentative until they have been confirmed by examination of the type-material.

## TYPE-MATERIAL AND THE DESIGNATION OF LECTOTYPES

Until comparatively recently it was not generally accepted practice amongst workers on the Elateridae, when they described a new species, to designate a single specimen as the holotype. Many early writers did not even record the number of specimens they had before them at the time of the description or to whom they belonged or where they were preserved. The majority did no more than place a determination label on one or more specimens. Sometimes they included the word 'type' on the label, but no worker appears to have been consistent in his actions.

Many subsequent workers and museum curators have accepted these specimens with the describer's determination label (either with or without the word 'type') as holotypes and very often affixed distinctive type-labels (referred to as 'curatorial labels' in the present work) to them.

While the acceptance of these 'types by tradition' may appear to be perfectly satisfactory, in the majority of cases it can also create considerable difficulties. These arise mainly because in the past the word 'type' did not have the same meaning as it does at the present time. It was often used by workers to indicate that, in their opinion, a particular specimen was a typical example of a species. As a result several specimens, sometimes belonging to different species or even different genera and preserved in different collections, have been labelled and treated as holotypes.

In order to overcome these difficulties Article 73 of the International Code of Zoological Nomenclature has been strictly observed. In the absence of a definite statement by the author that the description of a new species is based on a single specimen or that a particular specimen is the type (or some similar unambiguous expression) it has been assumed that the description is based on a syntype series and that a lectotype designation is required.

In this work lectotypes have been designated for those species for which it has been possible to locate and assemble all the known extant specimens of the original series or at least the greater part of it. Wherever possible the specimen marked 'type' by the describer, or that traditionally regarded as the type, whether so labelled or not, has been designated as the lectotype.

Where a reviser has stated that a particular specimen is the type, when it is clear that the original description is based on more than one specimen (e.g. Van Zwaluwenburg, 1959 : 354, *Lacon variolus* Candèze [= *Agrypnus*, see p. 228] described from an unrecorded, but large, number of specimens) this statement has been accepted as a valid lectotype designation unless there is sufficient evidence that the description was based on another specimen or the specimen is unsuitable for some other reason (e.g. badly damaged or the genitalia lost).

It has been assumed, unless the author states that the material on which the description is based is the property of some other individual or institution, or is part of a collection made by travellers or exploring parties and subsequently acquired by a collector or institution, that the type-material was in the describer's own collection. Syntype material found in other collections is assumed to have been acquired by the new owner as a gift or by exchange or purchase. Short

notes on the history of each collection consulted in the course of this work will be found on pages 270-281.

#### NOTES ON THE FORMAT OF THE ANNOTATED CATALOGUE

Except in the case of *Adelocera*, which is treated in greater detail (see p. 22), the following information is given for each species: the original combination with the author, date and reference and, where there has been a change, the most recently published combination. In those cases in which a previously published combination is restored, the first use of that combination is recorded.

Labels on holotypes, paratypes, lectotypes and paralectotypes are quoted verbatim throughout, but in addition the country name (when known for certain) is given first in its current form, in capitals, whether or not it occurs on the labels. All lectotypes, paralectotypes and syntypes and also, where necessary, holotypes and paratypes have been appropriately labelled. Labels on other specimens are quoted verbatim in sufficient detail for them to be identified where this is necessary; in other cases the data are listed in a standardized form. The handwriting on labels has been identified wherever possible, and the name of the writer given in square brackets. Labels without this information are in a handwriting unknown to me or printed.

Geographical place-names appearing in *The Times Index-Gazetteer of the World*, 1965, are recorded without comment. For place-names not appearing in *The Times Index-Gazetteer* the alternative present-day name or the latitude and longitude are given in square brackets. A list of gazetteers consulted in the course of this work will be found at the end of the References.

#### ABBREVIATIONS AND SYMBOLS USED IN THE CATALOGUE

- ; A semicolon is used to show the extent of each label where this is quoted verbatim.
- / An oblique line indicates the extent of data on upper and lower side of one label.
- [ ] Square brackets indicate additional information concerning labels, such as the identification of handwriting, the meaning of numbers, letters or signs on, or the colours of labels, alternative spellings of place-names, etc.
- ? A question mark before the name of a collection indicates that the available evidence indicates that the material in question is believed to be in that collection but that its presence there has not been confirmed.

The names of institutions, museums and collections containing material are abbreviated as follows:

AM, Sydney	Australian Museum, N.S.W., Australia.
ANS, Philadelphia	Academy of Natural Sciences of Philadelphia, Pennsylvania, U.S.A.
BMNH	British Museum (Natural History), London, England.
BPBM, Honolulu	Bernice P. Bishop Museum, Hawaii.
CAS, San Francisco	California Academy of Sciences, U.S.A.
CIE, London	Commonwealth Institute of Entomology, c/o BMNH.
CM, Pittsburgh	Carnegie Museum, Pennsylvania, U.S.A.
CMSN, Milan	Civico Museo di Storia Naturale, Italy.

DEI, Eberswalde	Deutsches Entomologisches Institut, East Germany (formerly at Berlin-Dahlem)
FRI, Dehra Dun	Forest Research Institute, India.
HSPA, Honolulu	Hawaiian Sugar Planter's Association, Hawaii.
IMZU, Turin	Museo ed Istituto di Zoologia dell'Università, Italy.
IRSNB, Brussels	Institut Royal des Sciences Naturelles de Belgique, Belgium.
IZPAN, Warsaw	Instytut Zoologiczny, Polska Akademia Nauk, Poland.
MCSN, Genoa	Museo Civico di Storia Naturale, Italy.
MCZ, Harvard	Museum of Comparative Zoology, Cambridge, Mass., U.S.A.
MM, Brno	Moravské Museum, Biologiky Ustav, Czechoslovakia.
MN, Santiago	Museo Nacional de Historia Natural, Chile.
MNHN, Paris	Museum National d'Histoire Naturelle, France.
MNHU, Berlin	Museum für Naturkunde der Humboldt-Universität, Germany.
NM, Basle	Naturhistorisches Museum, Switzerland.
NM, Nairobi	National Museum, Kenya. Formerly Coryndon Museum.
NM, Vienna	Naturhistorisches Museum, Austria.
NMV, Melbourne	National Museum of Victoria, Australia.
NR, Stockholm	Naturhistoriska Riksmuseum, Sweden.
RNH, Leiden	Rijksmuseum van Natuurlijke Historie, Netherlands.
SAM, Adelaide	South Australian Museum, Australia.
TM, Budapest	Természettudományi Museum, Hungary.
TU, Turku	Department of Zoology, Turku University, Finland.
UM, Oxford	Hope Department, University Museum, England.
USNM, Washington	Smithsonian Institution, United States National Museum, Washington, D.C., U.S.A.
UZM, Copenhagen	Universitetets Zoologiske Museum, Denmark.
ZI, Leningrad	Zoological Institute of the Academy of Sciences, U.S.S.R.
ZIMLU, Halle-Wittenburg	Zoologisches Institut, Martin Luther Universität, Halle-Wittenburg, East Germany.
ZM, Amsterdam	Zoologisch Museum, Netherlands.
ZMU, Helenski	Zoological Museum of the University, Finland.
ZMU, Moscow	Zoological Museum of the University of Moscow, U.S.S.R.
ZSBS, Munich	Zoologische Sammlung des Bayerischen Staates, West Germany.
ZUM, Uppsala	Zoologisk Universitets Museum, Sweden.

## NOTE ON THE LINE AS A UNIT OF MEASUREMENT

Some nineteenth-century workers used the line as a unit of measurement in their descriptions. A six inch ivory ruler produced by Janson of Russell Street, London, shows that the English, French and German lines differ in length. In the present work the following metric equivalents are used:

1 English line = 2.117 mm

1 German line = 2.191 mm

1 French line = 2.250 mm

## SPECIES REMOVED FROM THE SUBFAMILY AGRYPNINAE

***Propsephus tropicus* (Hope) comb. n.**

*Agrypnus tropicus*, Hope, 1843b : 365.

LECTOTYPE (present designation), LIBERIA: ♀ *tropicus* Hope, Palmas [Hope]; Type, Hope, Ann. Nat. Hist 11. 1843 p. 365. coll. Hope Oxon [UM, Oxford]

curatorial label]; Type coll. 1546½, *Agrypnus tropicus*, Hope, Hope Dept [UM, Oxford curatorial label] (UM, Oxford).

Paralectotype. ♀ Palmas [Hope] and UM Oxford curatorial labels as above except that this specimen bears the number 1546½ (UM, Oxford).

The published locality is 'West Africa, circa Palmas.' [Cape Palmas.] Candèze (1857 : 30) states that the species may be a synonym of *A. puber* Candèze (1857 : 30) or a related species but that Hope's description is so short that it is impossible to recognize the species from the description. Examination of the type-material has shown that Hope was mistaken in his generic attribution.

*P. tropicus* bears a very strong resemblance to *P. beninensis* (Candèze) but further study of both species is necessary before the synonymy can be confirmed.

#### SPECIES INCERTAE SEDIS

The type-material of the following species cannot be found and is assumed to be lost or destroyed. The descriptions are too poor to allow even a tentative generic attribution to be made.

#### *Lacon adanensis* Jagemann

*Lacon adanensis* Jagemann, 1944 : 333.

The description is based on an unrecorded number of specimens from Adana [TURKEY]. The Jagemann collection is now in the MM, Brno, but neither the type-material nor any determined specimens can be found there. It is not in Jagemann's possession (Dr Stehlik in litt.).

Jagemann compares *adanensis* with '*L. cyprii* Baudi'. Baudi did not describe a species of this name. Jagemann is presumably referring to *L. pygmaeus* Baudi, 1871, described from Cyprus (see p. 45).

#### *Lacon anathesinus* Candèze

*Lacon anathesinus* Candèze, 1897 : 10.

The description is based on an unrecorded number of specimens from CHINA. The type-material cannot be found in the BMNH or IRSNB, in Brussels. No determined specimens of this species which, according to Candèze, resembles *Anathesis laconoides* Candèze, have been located.

#### THE PROPOSED CLASSIFICATION OF THE AGRYPNINAE, WITH AN ANNOTATED CATALOGUE OF THE KNOWN SPECIES

##### Subfamily AGRYPNINAE Candèze

*Agrypnides* Candèze, 1857 : 17. Type-genus: *Agrypnus* Eschscholtz, 1829.

*Agrypnites* Jacquelin du Val, 1859 : 125.

*Agrypnini* Kiesenwetter, 1863 : 230.

*Agrypnina* Thomson, 1864 : 59.

*Agrypnidae* Fleutiaux, 1891 : 387.

*Adelocerini* Buysson, 1893 : 18. Type-genus: *Adelocera* Latreille, 1829.

*Adelocerinae* Fleutiaux, 1926 : 92.

*Agrypnitae* Fleutiaux, 1941c : 42.

*Adelocerina* Blackwelder, 1944 : 280

*Agrypninae* Fleutiaux, 1947 : 241.

Certain recent workers (Arnett, 1952; Arnett, Mignot & Smith, 1969) base the family-group name (subfamily, tribe), which they apply to the Elateridae considered in the present work, on *Adelocera*. They are presumably basing their action on Buysson (1893), who believed that a family-group name should be based on the oldest included genus within the category under consideration. However Article 36 of the International Code of Zoological Nomenclature makes it quite clear that the family-group name must be based on *Agrypnus*, on which Candèze (1857), who was the first worker to propose a name for a supra-generic group, based the name of the tribe Agrypnides. Candèze's comment at the bottom of page 14 suggests that Lacordaire was responsible for the naming of the tribe. Though this may be true (Candèze, 1857 : vi), Candèze's work bears the date Mai, 1857 whereas Lacordaire's did not appear until June of the same year (see p. 291).

**DIAGNOSIS.** Underside of the prothorax with grooves for the reception of part, or the whole, of the antennae. The grooves occupy the position and at least one third of the length of the prosternopleural sutures. Meso- and metasternum not connate between the mesocoxae.

**DISTRIBUTION.** The subfamily is represented in all regions. The largest number of genera and species is found in the Ethiopian and Oriental regions. Only a single species, *Agrypnus variabilis* (Candèze), occurs in New Zealand. Sharp (1877 : 479) comments that he suspects that this species has been introduced [from Australia] by marine traffic; it appears now to be fairly well established (see p. 227).

Though the characteristics listed above distinguish the species considered in this work from all other Elateridae, I believe that the subfamily includes species which are only very distantly related. Further studies and the evaluation of the importance at family-group level of such characteristics as the setae at the base of the claws, the tibial spurs and the structure of the margin of the mesocoxal cavity may eventually provide a basis for the subdivision of the family on more natural lines.

### ADELOCERA Latreille

*Adelocera* Latreille, 1829 : 451. Type-species: *Elater ovalis* Germar, by subsequent designation (Hyslop, 1921 : 632).

[*Lacon* sensu Germar, 1840 and subsequent authors nec Castelnau, 1836. Pars.]

*Agraeus* Candèze, 1857 : 165. Type-species: *Agraeus mannerheimi* Candèze, by monotypy.

#### Syn. n.

*Pericus* Candèze, 1857 : 167. Type-species: *Pericus nitidus* Candèze, by monotypy. **Syn. n.**

*Brachylacon* Motschulsky, 1858 : 60. Type-species: *Brachylacon microcephalus* Motschulsky, by monotypy. [Wrongly synonymized with *Lacon* Castelnau by Gemminger & Harold, 1864 : 1491.] **Syn. n.**

*Trachylacon* Motschulsky, 1858 : 61. Type-species: *Trachylacon fulvicollis* Motschulsky, by subsequent designation (Hyslop, 1921 : 672). [Synonymized with *Agraeus* Candèze by Schwarz, 1906 : 27.]

*Cavicoxum* Pic, 1928 : 21. Type-species: *Cavicoxum monstrosum* Pic, by monotypy. [Synonymized with *Agraeus* Candèze by Fleutiaux, 1931 : 79.]

*Prolacon* Fleutiaux, 1934d : 179. Type-species: *Prolacon alluaudi* Fleutiaux by monotypy.

#### Syn. n.

*Aganolacon* Ohira, 1967 : 55 (as a subgenus of *Brachylacon*). Type-species: *Aganolacon shirozui* Ohira, by monotypy. **Syn. n.**

GENERIC DIAGNOSIS. In the absence of the type-material or any other specimens of *Elater ovalis* Germar, the lectotype of *Lacon occidentalis* Candèze is used as the basis for determining the fundamental diagnostic characteristics of the genus *Adelocera* Latreille (see pp. 16-21).

Each claw bearing a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum does not form part of margin of mesocoxal cavity. Mesepimeron forms part of margin of mesocoxal cavity (Text-fig. 3). Second and third antennal segments subequal, each smaller than the fourth and following segments (Text-fig. 13). Antennal groove not extending beyond the anterior half of the prosternopleural suture, deep enough to accommodate the rolled antennae. Vestiture scale-like at least in part. Propleural tarsal grooves, if present, run parallel to the antennal grooves (Text-fig. 8). Metasternal tarsal grooves, if present, directed laterally so that the distal ends, if produced, would cut the lateral margin at a point at or within the anterior three-quarters of its length (Text-fig. 6). Scutellum variable in shape but never carinate. Tarsi with or without ventral lobes (Text-figs 15, 16).

RANGE OF VARIATION FOUND WITHIN THE GENUS. Species possessing this combination of diagnostic characteristics display a wide range of variation in the degree of development and modification of the anterior angles, lateral margin and discal area of the prothorax, the appearance of the elytra, the depth of the propleural and metasternal tarsal grooves, the structure of the fourth tarsal segment and the distribution of scales and setae on the body. In some species these characteristics are more strongly developed in one sex than in the other (see Sexual Dimorphism, p. 21). Up to the present time these features have been used to establish a number of genera and subgenera. Examination of material from all parts of the world has demonstrated the existence of so many intermediate forms that, in my opinion, there is no justification for the retention of the genera and subgenera which are discussed below.

HISTORY OF THE GENUS. The genus *Adelocera* was established by Latreille (1829 : 457) for *Elater ovalis* Germar, *Elater fuscus* Fabricius 'et quelques autres [unspecified] des Indes Orientales rapportés par M. de Labilliardiere'. In a post-humous work Latreille (1834 : 144) states that *Adelocera* 'a pour types une espèce de Java qui me paraît être l'*Elater fuscus* de Fabricius et un autre de Savanah, très rapprochée de son *E. marmoratus*, si ce n'est pas lui.' This statement is unacceptable and invalid as the type-designation of the type-species of *Adelocera*. Hyslop (1921 : 629) subsequently designated *Elater ovalis* Germar as the type-species of *Adelocera*.

Some years later Germar (1840 : 255) redefined *Adelocera*, presumably basing his interpretation on Latreille, 1834, since he credits the genus to Latreille, and includes *marmoratus* Fabricius and also *lepidoptera* Panzer and *conspersa* Gyllenhal, *varia* Olivier and *pennata* Fabricius, *fasciata* Linnaeus and *senilis* Germar, but not the species included in *Adelocera* by Latreille in 1829. Germar transferred *E. ovalis* to *Lacon*. He does not mention *Elater fuscus* Fabricius at all, probably because Eschscholtz (1829 : 32) had transferred it (erroneously, see p. 158) to *Melanotus*. Thomson (1859 : 103) subsequently designated *Elater fasciatus* Linnaeus as the type-species of *Adelocera*, which he credits to Latreille though there can be no doubt that his concept of the genus is that of Germar.

Germar's interpretation of *Adelocera* was generally accepted until Hyslop (1921 : 621) drew attention to the fact that [as a result of his designation of species originally included in the genera *Adelocera* Latreille, 1829 and *Lacon* Castelnau, 1836 to replace the type-species erroneously selected by Thomson (1859 : 103, see above and p. 54)] 'the two genera *Adelocera* and *Lacon* have been reversed in their application'. Fleutiaux (1925b) independently came to the same conclusion and the following year he published a correction (Fleutiaux, 1926) to the Schenkling catalogue to this effect. As Hyslop does not give any clear indication which species are to be included in his interpretation of *Adelocera* and *Lacon*, the present author has accepted Fleutiaux (1926) as the author and date of the new combinations.

Unfortunately the majority of workers appear to have overlooked Hyslop's and Fleutiaux's corrections, with the result that there are many apparently conflicting generic attributions in the more recent literature. This, together with the fact that the type-material of *Elatér ovalis* cannot be found and that as a result each worker has his own interpretation of the genus, is the main cause of the confusion within the subfamily.

NOTES ON THE GENERA AND SUBGENERA PLACED IN SYNONYMY WITH *Adelocera*. *Agraeus* was erected for a single species, *mannerheimii* Candèze. Candèze (1857 : 166) remarks that the genus is based more on general appearance than 'caractères réellement générique'. The present investigations have shown this to be true. The characters used by Fleutiaux (1927 : 88 and 1935a : 12) in his redefinition are all of the variable type discussed on p. 14. The species included by these authors display a considerable degree of sexual dimorphism.

*Pericus*. Candèze's comment on *Agraeus* also applies to this monobasic genus. Thirty-five years later (1892c : 485) he remarked that *discedens* Candèze is a 'forme de transition' between *Pericus* and his interpretation of *Lacon* [= *Agrypnus* of the present work], and that, in this species the generic characters 'tendent de se dégénérer pour rapprocher des *Lacon* du group II, div. C.' (Candèze, 1891c : 23, *obesus* Candèze, *nebulosus* Candèze, etc.). The species which were included in this genus display a moderate degree of sexual dimorphism.

*Brachylacon*. The type-species, *microcephalus* Motschulsky, differs from the present interpretation (see p. 38) of *ovalis* Germar, the type of *Adelocera*, only in the depth of the propleural and metasternal tarsal grooves and the structure of the fourth tarsal segment.

*Trachylacon* was erected to accommodate species differing from *Brachylacon* in the puncturation of the elytra. In species attributed to *Trachylacon* the puncturation is confused and not arranged in regular rows. However, in certain species, such as *fulvicollis* Motschulsky, the elytral puncturation appears confused but closer inspection shows that there is a definite tendency towards a regular striate arrangement in the apical portion of the elytra. The characters used by Fleutiaux (1935a) to redefine the genus are all of the variable type discussed on p. 14.

*Cavicoxum*. Pic erected the family Cavicoxumidae for this monobasic genus.

Fleutiaux (1931: 74) recognized it as a member of the Elateridae and at that time regarded it as congeneric with *Agraeus*. Ten years later (1941c) he re-erected the genus using the length of the lateral carina of the prothorax, which attains the anterior margin, as the characteristic separating it from his interpretation of *Agraeus*. The length of the lateral carina is one of the characteristics displaying too great a range of variation to be of value at the generic level. The type-species, *monstrosus* Pic, is the female of *constrictus* Ritsema, a species displaying a very marked degree of sexual dimorphism.

*Prolacon* was erected for a single species, *alluaudi* Fleutiaux, which the author described as having antennal grooves open anteriorly and widely excavate posteriorly and metathoracic episterna which are parallel-sided and very narrow. Examination of the type-material (see p. 32 under *fleutiauxi*) has shown that the antennal grooves do not differ from those found in other species assigned to *Adelocera*; the prosternopleural suture is deeply grooved anteriorly and closed posteriorly. It would appear that Fleutiaux misinterpreted the paired carinae on, and the steeply declivous sides of, the posterior portion of the prosternum as forming the posterior part of the antennal groove. The metathoracic episterna are visible only as very small triangular sclerites lying beside the anterior angles of the metasternum. It seems probable that Fleutiaux was misled by the carina which runs parallel and close to the inner margin of the epipleurae. The size of the metathoracic episterna does not appear to be of importance at the generic level. Fleutiaux also regarded the tubercles on the prothorax and elytra and the humeral carinae as diagnostic. Tubercles are discussed above. Humeral carinae are known to occur in other *Adelocera* species, including *trifasciatus microcephalus* Motschulsky.

*Aganolacon* was erected as a subgenus of *Brachylacon* for those species in which the tarsal grooves of the propleura are not distinctly margined. This is one of the very variable characteristics discussed on p. 14.

THE TYPE-MATERIAL OF *Elater ovalis* GERMAR. Germar described *Elater ovalis* from Persia on two occasions. On the first (1824: 49) he used the name *Elater ovalis* Knochii [sic] but on the second (1840: 261) he omitted the reference to Knoch. On neither occasion did he record the number of specimens he had before him or the collection to which they belonged.

Fleutiaux (1941c: 46) records that the type of *Elater ovalis* Germar is in the ZMHU, Berlin. Dr F. Hieke, curator of Coleoptera in that institution has searched the collections on my behalf without success. There are no specimens which are named as, or which could be, *ovalis* Germar in the ZMHU, Berlin collection, which contains part of the Germar and also all the known extant part of the Knoch collection (see p. 276). Fleutiaux was in the habit of recording the fact that he had seen the type of a species in some other collection by placing a note to this effect in his own collection. The fact that there is no note on *ovalis* in his collection suggests that he did not see the type-material but based his statement on the assumption that the *ovalis* material was preserved in Germar's own collection.

Germar's collection was broken up (see p. 275) and in addition to the part in the ZMHU, Berlin, there are portions in the DEI, Eberswalde, the ZIMLU, Halle-

Wittenburg (formerly the University Zoological Museum, Halle) and the BMNH (see below). Dr Diekmann of the DEI, Eberswalde and Dr Hüsing of the ZIMLU, Halle-Wittenburg both write that there are no specimens of *ovalis* Germar in their collections.

Candèze's (1857 : 132) statement that he received material of *ovalis* from the Germar collection 'en communication' [? = loan] from Schaum suggests that at the time the type-material of *ovalis* was in Schaum's possession. However the *ovalis* material does not appear to have been included in that part of the Schaum collection which was acquired by the BMNH, as there are no specimens in the collection and the species is not listed in the BMNH manuscript catalogue of the Schaum collection. If Candèze (see below) did return the *ovalis* material to Schaum, it must have formed part of that portion of the Schaum collection which has been lost (see p. 280).

If, either by accident or design, Candèze retained the *ovalis* material he received from Schaum, it should have passed to the BMNH or the IRSNB, Brussels (see p. 271). Neither collection contains any specimens determined as, or which could be, *ovalis* Germar. The species is not recorded in Waterhouse's manuscript catalogue of Candèze's Elateridae in the Janson collection in the BMNH.

Since the most careful and repeated searches through the relevant collections have failed completely to discover the type-material of *Elater ovalis* Germar there is no alternative but to accept the fact that, almost certainly, the material has been lost or destroyed.

At first sight the loss of the type-material of *Elater ovalis* Germar, together with the fact that no determined specimens of the species can be found (see also p. 21), appears to make it impossible to draw up a generic diagnosis of *Adelocera*. However I believe that the evidence produced by the study of the literature is sufficient to justify the use of the lectotype of *Lacon occidentalis* Candèze for this purpose.

THE DIAGNOSTIC FEATURES OF *Elater ovalis* GERMAR. Germar's (1824 : 49) *Elater ovalis* is a dark-coloured beetle with reddish legs and antennae. Germar describes it as follows [translated from the Latin by CMFH]. 'The round head is pitchy black in colour and deeply sunk into the prothorax which is strongly emarginate anteriorly. The prothorax is the same colour as the head but the lateral margins are paler; it is convex with the lateral margins arcuate and slightly convergent anteriorly; the posterior margin is straight and the posterior angles more or less right-angled. The elytra are convex, as broad as the prothorax and twice as long, the apex rounded. The head is closely punctured, the prothorax closely and sparsely punctured and the elytra punctate-striate with convex interstriae. The prothoracic pubescence is grey and the elytra bear squamiform setae which arise from the punctures. The underside is black and coarsely and closely punctured. The serrate antennae are accommodated in grooves on the underside of the prothorax, which also bears deep, shiny, angled depressions for the reception of the anterior legs'. Germar does not record the length but states that it is 'shorter, but not narrower than *E. ripario*'. Germar does not mention *E. ripario* in his 1824 publication. His first reference to the species (as *E. riparius*

Fabricius) is in 1844 (p. 139) when he published what amounts to a revision of *Cryptohypnus*.

As the comparison with *E. ripario* provides a clue to the size of *E. ovalis* it is necessary to discover whether at that time there was a generally accepted interpretation of *E. ripario*. In 1824 the only published descriptions of *E. riparius* were those of Fabricius (1792 : 232 and 1801 : 243, referring to 1792), Paykull (1800 : 41, referring to Fabricius, 1792) and Gyllenhal (1808 : 402, referring to Fabricius, 1801). The *E. riparius* figured by Panzer (1796) with a reference to Fabricius (1792) was redescribed as *rivularis* by Gyllenhal (1808 : 403). Schenkling (1925 : 202) lists both species under *Hypnoidus*. The specimens standing under these names in the BMNH, IRSNB, Brussels and MNHN, Paris indicate that there is a general agreement concerning the identity of these two species, which range in size between 4.7 mm and 7.5 mm.

In his second, shorter description of *ovalis*, Germar (1840 : 261) refers to his work of 1824. He gives the length as a little over 2 lines (about 5.5 mm, see p. 11) and remarks that the deep femoral and tibial grooves of the prothorax have sharply defined margins. Germar does not otherwise amplify his original description. He does, however, include *ovalis* in *Lacon* (sensu Germar not Castelnau, 1836, see p. 14) so that it is not unreasonable to assume that *ovalis* possesses the characteristics of his interpretation of that genus. Germar (1840 : 260) redefined *Lacon*, transferring all the originally included species (see p. 53) to other genera. According to Germar the characteristics of the genus *Lacon* are as follows:—

Short serrate antennae in which the 2nd and 3rd segments are small and the 12th more or less invisible.<sup>1</sup> The median portion of the prosternum is strongly protruberant and separated from the lateral portions by grooves which extend the whole length of the sternite. [By this Germar presumably means from the anterior margin of the prosternum to a point immediately in front of the anterior coxae. In his description of *L. caliginosus* Boisduval, Germar comments that this species differs from the others in the genus in that these grooves extend only a little over half way.] Transverse grooves for the accommodation of the anterior femora are present at the base of the lateral portion of the underside of the prothorax [propleurae] and, in some species, oblique grooves for the reception of the anterior tarsi.

No known species possess this combination of characters and also the grooves for the accommodation of the anterior tarsi mentioned in the description of *ovalis*. The species which bear the closest resemblance to the description of *ovalis* are those belonging to the genus *Opatelus* Candèze, 1857. In these Brazilian and Bolivian species the antennal groove ends close to the anterior coxae, the distance between the end of the groove and the coxa being equal to the diameter of the coxae. When examined under a hand lens the groove appears to attain the coxa. *Opatelus* species have lobed tarsi, but this is not very obvious under a hand lens.

It is however unlikely that Germar had a South American species before him when he described *ovalis*. As Germar's first description of *ovalis* refers to Knoch,

<sup>1</sup> The antennae are presumably 11-segmented. In his description of *mustelinus*, Germar states that the 12th antennal segment is visible. In this species (see p. 188) the apical third of the eleventh segment is marked off from the rest of the segment by a constriction. This may have led Germar to believe that the antennae were 12-segmented. The same is true of *Agrypnus notodonta* Latreille (see p. 256), which according to Germar (1840 : 251, 252) has 12-segmented antennae.

it seems reasonable to assume that he based his description on material in the Knoch collection or on specimens received from Knoch. At the beginning of the nineteenth century South American material was still something of a rarity and as Zincken (1818) makes no mention of any such material in his account of Knoch's collection it is probable that none was present. The belief that *ovalis* is not a South American *Opatelus* species is supported by the fact that Candèze (1857 : 132), who examined Germar's *ovalis* material, did not recognize it as a member of his own new genus.

In the absence of any known species or undetermined material agreeing with Germar's description of *ovalis*, the only course left open is to consider the possibility that Germar misinterpreted certain structural characteristics of the species included in his interpretation of *Lacon* and that as a result his generic diagnosis is inaccurate and misleading. This is not beyond the bounds of possibility, as some of the included species are small and the position taken up by the legs when the beetles are killed tends to obscure the details of the structure of the underside. Germar's optical equipment also will have been very inadequate by present-day standards. It was probably no more than a simple hand-lens. It is also possible that the inflammation of the eyes which afflicted Germar during the last ten years of his life (he died in July, 1853) was already causing his eyesight to deteriorate (Schaum, 1853 : 380).

In order to discover whether this is the case, Germar's material of his *Lacon* species was, as far as possible, located and examined. The details of the specimens are recorded in the catalogue portion of this work. The results of this investigation are presented in the following table.

From the table it is immediately obvious that all Germar's *Lacon* species differ from his generic diagnosis in that the antennal groove does not extend the entire length of the prosternum, or in other words it does not attain the anterior coxae. In this characteristic all the species resemble *caliginosus*, which Germar regarded as an exception, remarking that the antennal grooves extend only a little way beyond the middle of the length of the prosternum. In all twelve known species the tibial spurs are not merely indistinct but entirely absent.

It is not unreasonable to assume that *ovalis* possesses the same characteristics as the other twelve species included in the genus. Evidence that this assumption is justified is found in the work of Candèze (1857 : 130), who appears to have been the last man to see Germar's material. Candèze places *ovalis* in his interpretation of *Lacon*, which differs from that of Germar in that the prosternopleural suture is closed posteriorly so that the antennal groove does not attain the anterior coxae.

In the same work Candèze (1857 : 130) described *Lacon occidentalis* from Senegal, remarking that this species could at first sight be confused with *ovalis* Germar but can be distinguished by the presence of white scales among the black ones clothing the body. The lectotype of *L. occidentalis* Candèze (a synonym of *Adelocera parvus* (Boheman), see p. 43) is in the BMNH.

Additional information concerning the structure and appearance of *ovalis* is provided by Baudi (1871 : 49), who refers to *ovalis* Germar in his description of *Lacon pygmaeus* from Cyprus, remarking that his species may be little more than

Table to illustrate how the species included in *Lacon* Germar, 1840 (nec Castelnau, 1836) agree and differ from the generic diagnosis

Species included by Germar	Generic characteristics listed by Germar							Other characteristics
	Antennae 11-segmented* (2)	Antennal segments 2 and 3 small, subequal	Prosternopleural antennal extends the entire length of the prosternum	Propleurae with transverse grooves for the accommodation of the femora	Propleural tarsal grooves present (p) or absent (a)	Tibial spurs present* (3)	Tarsi simple, without ventral lobes	Mesepimeron forms part of margin of mesocoxal cavity
<i>caliginosus</i> Boisduval (page 136)	✓	✓	⊗	✓	✓ p	×	✓	No
<i>crenatus</i> Klug sensu Germar (page 145)	✓	✓	×	✓	✓ p	×	✓	No
<i>crenicollis</i> Ménétriés (page 145)	✓	✓	×	✓	✓ a	×	✓	No
<i>irroratus</i> Klug (page 171)	✓	✓	×	✓	✓ a	×	✓	No
<i>murinus</i> Linnaeus (page 186)	✓	✓	×	✓	✓ a	×	✓	No
<i>mustelinus</i> Germar (page 188)	✓	✓	×	✓	✓ a	×	✓	No
<i>muticus</i> Herbst (page 189)	✓	✓	×	✓	✓ p	×	✓	No
<i>nodifer</i> Klug (page 191)	✓	✓	×	✓	✓ a	×	✓	No
<i>parviceps</i> Schoenherr (page 196)	✓	✓	×	✓	✓ p	×	×	No
<i>terrenus</i> Germar [= <i>crenatus</i> Klug] (page 145)	✓	✓	×	✓	✓ p	×	✓	No
<i>turbidus</i> Germar (page 224)	✓	✓	×	✓	✓ a	×	✓	No
<i>vestitus</i> Klug (page 228)	✓	✓	×	✓	✓ a	×	✓	No
<i>ovalis</i> Germar (page 16)								
Species believed to resemble <i>ovalis</i> Germar								
<i>occidentalis</i> Candeze (page 43)	✓	✓	×	✓	✓ p	×	✓	Yes
<i>pygmaeus</i> Baudi (page 45)	✓	✓	×	✓	✓ p	×	✓	Yes

Key to the symbols used in the table

✓ = specimen agrees with Germar's generic diagnosis.

×

⊗ = differs from generic diagnosis but agrees with the description of the species.

\* (2) In the key Germar (1840 : 251) states that the 12th antennal segment is not visible. In the generic diagnosis (page 260) he states that the 12th segment is more or less hidden.

\* (3) Germar's 'kaum sichtbaren Enddorn' suggests that the tibial spur is present but indistinct.

a variety of *ovalis* Germar. The type of *pygmaeus* is in the IMZU, Turin (p. 45). Apart from the colour it bears a close resemblance to *occidentalis* Candèze. Whether Baudi based his interpretation of *ovalis* on the description or some material, now lost, is unknown.

The diagnostic characteristics of *occidentalis* Candèze and *pygmaeus* Baudi are included in the table. It can be seen that they possess the characteristic features of Germar's *Lacon* species and differ from Germar's generic diagnosis in the same way as the other species.

These investigations have shown that no known species possesses the combination of characteristics attributed to *Lacon ovalis* by Germar. Although it is conceivable that such a species may yet be found, the evidence obtained from the re-examination of Germar's *Lacon* material suggests that Germar misinterpreted the structure of the antennal groove in all the species (with the exception of *caliginosus*) included in his interpretation of *Lacon*, and that as a result his generic diagnosis is inaccurate and misleading. The antennal groove does not occupy the entire length of the prosternopleural suture as stated by Germar, but extends only a little beyond the half-way mark. As this type of groove also occurs in *occidentalis* Candèze I consider that Candèze's comment that *ovalis* bears a close resemblance to *occidentalis* can be accepted without reservation.

OTHER SPECIMENS OF *Elater ovalis* GERMAR. Up to the present time I have been unable to discover any specimens determined as *ovalis* Germar in any of the museums and institutions listed on pages 10 and 11.

Latreille (1829 : 251) and Castelnau (1840 : 24) are the only workers, apart from Candèze, Baudi (see p. 19) and cataloguers, to make any reference to *ovalis* Germar. As they do not record any specimens and as neither of their collections contain determined material of *ovalis* it seems probable that they based their interpretation of the species on the description.

There are no published records of the capture of *ovalis* from the type-locality, Persia (Iran) or from anywhere else. Enquiries of the principal museums at home and abroad have failed to discover any undetermined material from Persia which bears a strong resemblance to *occidentalis*. Examination of the descriptions of unknown species from South-west Asia attributed to *Lacon* sensu auct. (nec Castelnau) or related genera has failed to disclose any *occidentalis*-like species. *Lacon adanensis* Jagemann (1944 : 333), described from Adana (Turkey), is approximately the right size but the description is too poor to be of any value and up to the present time it has proved impossible to find the type-material (see p. 12).

SEXUAL DIMORPHISM. Pronounced sexual dimorphism is not common in the Elateridae. It is however very strongly developed in certain *Adelocera* species, a fact that has not been recognized before and which has led to the males and females of certain species being described as distinct species and in some cases being attributed to different genera.

The sexual dimorphism resembles that found in other groups of insects, including the Coleoptera, in that individuals of one sex are more ornate and often larger than those of the opposite sex. *Adelocera* species are unusual in that it is the

female which displays a greater degree of development and modification of the prothorax. The smooth patch, pore or brush of setae present on the terminal and/or penultimate abdominal sternites of the females of many *Agrypnus* species does not occur in *Adelocera*.

DISTRIBUTION. Up to the present time one species, (*minutus* (Candèze)) has been recorded from the Nearctic while the remainder occur in the Ethiopian and Oriental regions. All the Australian species listed under *Adelocera* by Neboiss (1961) following Van Zwaluwenburg (1959) have been found, on examination, to belong to the genus *Agrypnus*.

BIOLOGY AND HABITS. Nothing is known of the history and habits of *Adelocera* species. The adults have been found on plants and trees and on the ground.

#### SPECIES INCLUDED IN THE GENUS

The following 75 species are now assigned to the genus.

Because of the unusual type of sexual dimorphism displayed by certain species the genus has been studied in greater detail than the other genera included in this work.

Every reference to each species has been consulted. In every case in which a worker has recorded a specimen or specimens, every effort has been made to locate and examine the material. Where this has proved possible, the reference is included in the specific synonymy of the appropriate species and the data on the material and its present location recorded. A list of any previously unrecorded specimens is also given.

#### *Adelocera adspersus* (Candèze)

*Lacon adspersus* Candèze, 1857 : 115.

*Adelocera adspersus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: ♀, N. India, Bacon; Janson coll. 1903 : 130; *adspersus* Cdz. type [Cand.]; *Lacon adspersus* Cdze., Cand. Type e coll. de Laferté [Janson] (BMNH).

Candèze records the locality as 'Des Indes-orientales-boreales' (see p. 271). I have not found any specimens with this locality. The discrepancy between the published locality and the label is almost certainly due to Janson (see p. 276).

Candèze (1890 : cxcix and 1892c : 484) recorded this species from Chota Nagpore, (see p. 273). The Fleutiaux collection in the MNHN, Paris contains a female which I believe to be part of Candèze's series. It bears Fleutiaux's determination labels '*adspersus* teste Cand., Chota Nagp. Bengale' and 'Cand., C.R. Soc. Ent. Belge 1890, Ann. Soc. Ent. Belge 1892'. Beside the specimen there are two labels, also in Fleutiaux's handwriting 'non *adspersus* 1857' and 'non *adspersus* Cand. Mus. Brus. 1928'. The specimen is not conspecific with the lectotype. The IRSNB, Brussels also possesses a number of specimens standing as *adspersus* Candèze including one bearing Candèze's label '*adspersus* Cand., Beng. P. Card.'. These specimens are not conspecific with the lectotype. Whether they are conspecific with the

specimens in the MNHN, Paris has not been verified. These specimens belong to one or more species unknown to me.

***Adelocera aethiopicus* (Candèze) comb. rev.**

*Lacon aethiopicus* Candèze, 1882 : 7.

*Lacon lineatus* Candèze, 1897 : 8. **Syn. n.**

*Adelocera aethiopicus* (Candèze) Fleutiaux, 1926 : 96.

*L. aethiopicus* Candèze. LECTOTYPE (present designation). ETHIOPIA: ♂, Bogos, 1870, Sciotel, O. Beccari; n.sp. *Aethiopicus* Cdz. Abyssinia [Candèze, yellow border]; Collection E. Candèze; *Lacon aethiopicus* Cand., det E. Candèze [IRSNB curatorial label]. (IRSNB, Brussels). The specimen measures 6 mm, compared with the published length of 5 mm.

The material recorded by Fleutiaux (1919 : 17) from Taveta, 2 ♂, 2 ♀ (BMNH), 8 ♂, 11 ♀, (MNHN, Paris), Pori de Serengeti, 1 ♀, (MNHN, Paris) and (1922 : 589) Sud du Lac Rudolphe, 3 ♂ (MNHN, Paris) is not conspecific and belongs to an unknown species. Cobos (1964 : 586) records a single female from Ennedi. This specimen, which is in the Cobos collection, is not *aethiopicus* Candèze. I believe it may be *testaceus* Fleutiaux, though the female of this species is unknown to me.

*L. lineatus* Candèze. LECTOTYPE (present designation). ETHIOPIA: ♀, Choa [Shoa]; C. Fairm.; *lineatus* Cand. Abyssinie [Candèze, yellow border]; Collection E. Candèze; *Lacon lineatus* Cd., det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

Other material examined. SOUTHERN YEMEN: Dhala, 4800 ft, 14.ix.1937, 1 ♂ (BMNH). SOMALI REPUBLIC: Hargeisia, 23-28.6.1963, 3 ♂ (BMNH); Duruksi, 20.v.1961, 1 ♂, 1 ♀ (BMNH); Wardair, 6°56'N., 45°20'E. viii.1945, open high bush with scattered grass, 1 ♀ (BMNH). KENYA: Turkana Prov., 2 ♀ (BMNH).

***Adelocera alluaudi* Fleutiaux comb. rev.**

*Adelocera alluaudi* Fleutiaux, 1919 : 9.

*Lacon alluaudi* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). TANZANIA: ♂, Afr. or. allemande, Kilimandjaro, versant sud-est, Alluaud & Jeannel; Zone inferieure, Riviere Himo, 1000 m, mars 1912, St.66; 2<sup>e</sup> et 3<sup>e</sup> articles des antennes petits, egaux [Fleut.]; *Adelocera alluaudi* Fleut., type [Fleut.]. (MNHN, Paris).

Paralectotype. TANZANIA: ♂, Afr. or. allemande, Neu Moshi (alt. 800 m) avril 1912, st. 72; *Adelocera alluaudi* Fleut., co-type [Fleut.] (MNHN, Paris).

***Adelocera andrewsi* (Fleutiaux) comb. n.**

*Agraeus andrewsi* Fleutiaux, 1935a : 23.

LECTOTYPE (present designation). BURMA: ♀, Burmah; Tharrawaddy, C. Q.

Corbett, coll. Andrewes; andrewsi Fleut., type [Fleut.]; andrewsi Fleut., n.sp. [Fleut.] (MNHN, Paris).

Paralectotype. BURMA: ♀, Tharrawaddy, Burma; *Agraeus andrewsi* Fleut. [Fleut.] 1 ex., Pegu [17°20'N., 65°29'E.] India (MNHN, Paris). Abdomen missing.

I have not had the opportunity of examining the syntype material from Katha [24°10'N., 96°21'E.] (FRI, Dehra Dun).

***Adelocera baccatus* (Fleutiaux) comb. n.**

*Agraeus baccatus* Fleutiaux, 1935a : 26; figs.

LECTOTYPE (present designation). JAVA: ♀, Java; *Agraeus baccatus* Fleut., Type [Fleut.]. (MNHN, Paris).

Paralectotype. JAVA: ♀, Java; communiqué a Blöte, Mus. de Leyde [Fleut.]. (MNHN, Paris).

Dr Wiebes (in litt.) reports that the specimen recorded by Fleutiaux from Java, Wonosoba, mai (E. Jacobsen) cannot be found in the RNH, Leyden.

***Adelocera bakeri* (Fleutiaux) comb. n.**

*Trachylacon bakeri* Fleutiaux, 1935a : 14.

Holotype. PHILIPPINES: ♀, Philipines, Imugin, N. Viscaya, Baker; *Adelocera bakeri* Fleut., type [Fleut.]. (MNHN, Paris).

***Adelocera beauchenei* (Fleutiaux) comb. rev.**

*Lacon beauchenei* Fleutiaux, 1918d : 195.

*Adelocera beauchenei* (Fleutiaux) Fleutiaux, 1926 : 96.

*Brachylacon beauchenei* (Fleutiaux) Fleutiaux, 1927 : 90; fig. 1.

*Brachylacon beauchenei* (Fleutiaux); Fleutiaux, 1947 : 254.

*Brachylacon (Aganolacon) beauchenei* (Fleutiaux); Ohira, 1967a : 55.

LECTOTYPE (present designation). NORTH VIETNAM: ♂, Bao Lac, Tonkin; Museum Paris, Coll. E. Fleutiaux; *Lacon beaucheni* Fleut. type: Ann. Soc. Ent. Fr. 1918 : 195. Collection Fleutiaux [Fleut.] (MNHN, Paris).

Other material examined. NORTH VIETNAM: Hoa Binh, Lac Tho, 1 ex. (Fleutiaux, 1927 and 1947 locality). (MNHN, Paris).

***Adelocera bhasini* (Fleutiaux) comb. n.**

*Agraeus bhasini* Fleutiaux, 1932d : 228, figs.

*Agraeus bhasini* Fleutiaux; Fleutiaux, 1935a : 28.

Lectotype (designated by Fleutiaux, 1935a). INDIA: ♀, New Forest, Dehra Dun, G.D. Bhasin, 13.viii [sic]. 1928; on *Litsea polyantha*; *Agraeus bhasini* Fleut. [Fleut.] (MNHN, Paris).

Fleutiaux based his description on two specimens. I have not had the oppor-

tunity of examining the paralectotype from Landstowne [sic, perhaps Landsdowne, 29°52'N., 78°41'E.] Maurs, 2500 pieds (*M. M. Bhatia*) mars (FRI, Dehra, Dun).

***Adelocera birmanicus* (Fleutiaux) comb. n.**

*Agraeus birmanicus* Fleutiaux, 1935a : 22.

Holotype. BURMA: ♂, Toungoo; Toungoo, Birmanie; Andrews; *birmanicus* Fleut., type [Fleut.]; *birmanicus* n.sp. [Fleut.]; Coll. H. E. Andrewes; 1934.34 (BMNH).

***Adelocera borneensis* (Fleutiaux) comb. n.**

*Trachylacon borneensis* Fleutiaux, 1935a : 15.

LECTOTYPE (present designation). BORNEO: ♂, 59780 [Fry catalogue number = South East Borneo, Tamyang Lazary (position unknown). Dr Schreiber, Germ.Miss.]. German Mission; Borneo, S. East; Fry coll. 1903.130; *Trachylacon borneensis* Fleut., type [Fleut.]; *Trachylacon borneensis* n.sp. [Fleut.] (BMNH).

Paralectotype. ♂, same locality as the lectotype with Fleutiaux's determination label and a separate printed 'co-type' label (MNHN, Paris).

***Adelocera brunneus* (Lewis)**

*Lacon brunneus* Lewis, 1894 : 29.

*Adelocera brunneus* (Lewis) Fleutiaux, 1926 : 96.

Holotype. JAPAN: ♂, Japan, G. Lewis, 1910.320; Oyama, 24.v-26.v.80; *Lacon brunneus* Lewis, type [Lewis] (BMNH).

The specimen from Ceylon recorded by Lewis (loc. cit.) is in the BMNH. It bears the following labels: ♀, Ceylon, G. Lewis, 1910.320; Bengawantalawa, 900-5200 ft, 28.ii-12.iii.82; *Lacon brunneus* Lewis [Lewis]. As Lewis observes, it is very similar to the holotype, but in my opinion it is not conspecific with it.

I have not had the opportunity of examining the specimens recorded by Miwa (1934 : 9) and Ohira (1954b : 14 and 1967b : 105).

***Adelocera cambodiensis* (Fleutiaux) comb. n.**

[*Lacon tumens* Candèze; Fleutiaux, 1918d : 195. Misidentification.]

*Brachylacon cambodiensis* Fleutiaux, 1927 : 92.

*Brachylacon cambodiensis* Fleutiaux; Fleutiaux, 1947 : 253.

LECTOTYPE (present designation). CAMBODIA: ♂, Camboge Kampong Thon, Vitalis; *Lacon tumens* Cand. Fleut., 1918; *Lacon cambodiensis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. 1 ex., Laos, Vientiane, May 1915, R. V. de Salvaza; *Adelocera* (*Brachylacon*) *cambodiensis* Fleut. [Fleut.] (BMNH).

I have not seen the second specimen recorded from the type-locality by Fleutiaux (1918d).

***Adelocera catulus* (Candèze) comb. n.**

*Agraeus catulus* Candèze, 1893b : 11, ♂.

*Agraeus catulus* Candèze; Fleutiaux, 1935a : 27.

Lectotype (designated by Fleutiaux, 1935a). JAVA: ♂, Java oriental; Mts Tengger, Fruhst.; Type: n.sp. iv.91 [sic] *catulus* Cand., Java or. Fr. [Cand., yellow border]; Collection E. Candèze; *Agraeus catulus* Cd. det. E. Candèze [IRSNB curatorial label]; *catulus* Cand., Fleut. 1934 rev. [Fleut.] (IRSNB, Brussels).

Candèze based his description on six specimens. Fleutiaux (1935a : 27) designated the lectotype and described the remaining five specimens, which both he and Candèze believed to be females, as *Trachylacon confusus* (see below).

Other material examined. JAVA: Detr. de la Sonde [?Sunda Straits], 1 ♂ (Fleutiaux, 1935a locality) (MNHN, Paris); Toegoe [position unknown: there are a number of villages of this name in Java], 1 ♂ (RNH, Leyden).

***Adelocera confusus* (Fleutiaux) comb. n.**

*Trachylacon confusus* Fleutiaux, 1935a : 16.

*Agraeus catulus* Candèze, 1893b : 11, ♀.

Fleutiaux based his description on five specimens which Candèze believed to be females of *A. catulus* Candèze.

LECTOTYPE (present designation). JAVA: ♂, Java orientale; Collection E. Candèze; *Agraeus catulus* Cd., det. E. Candèze [IRSNB curatorial label]; *Trachylacon confusus* Fleut., pour *Agraeus catulus* ♀ Cand., Fleut. rev. 1934 [Fleut.] (IRSNB, Brussels).

Paralectotypes. 1 ♂, with the same labels as the lectotype, (MNHN, Paris). 1 ♂, 2 ♀, Java oriental; Collection E. Candèze; *Agraeus catulus* Cd. det. E. Candèze [IRSNB curatorial label]; E. Fleutiaux rev. 1934. *Trachylacon confusus* Fleut. [IRSNB curatorial label] (IRSNB, Brussels).

***Adelocera constrictus* (Ritsema) comb. n.**

*Agraeus constrictus* Ritsema, 1881 : 29.

[*Agraeus feroculus* Candèze; Fleutiaux, 1918d : 188. Misidentification.]

*Agraeus plumatus* Fleutiaux, 1927 : 95. [Synonymized with *constrictus* Ritsema by Fleutiaux, 1935a : 25.]

*Cavicoxum monstrosus* Pic, 1928 : 21. **Syn. n.**

*Agraeus monstrosus* (Pic); Fleutiaux, 1931 : 74. [Unjustified emendation.]

*Agraeus monstrosus* (Pic); Fleutiaux, 1935a : 28.

*Cavicoxum monstrosus* Pic; Fleutiaux, 1947 : 243.

*Agraeus constrictus* Ritsema; Fleutiaux, 1947 : 245.

*Agraeus constrictus* Ritsema. Holotype. JAVA: ♂, de Gavère, Batavia; *Agraeus constrictus* Rits., type [Rits.] (RNH, Leyden).

*Agraeus plumatus* Fleutiaux. LECTOTYPE (present designation). LAOS: ♀, Tathom, Laos, Vitalis. September 1915; *Agraeus plumatus* Fleut., type [Fleut.];

type de la figure [Fleut.]; *constrictus* Rits., *plumatus* Fleut., type de la figure [Fleut.] (MNHN, Paris). Fleutiaux based his description on the specimens he had misidentified as *A. feroculus* Candèze in 1918.

*Cavicoxum monstrosum* Pic. LECTOTYPE (present designation). LAOS: ♀, Laos, Kieng Khong, le 17.iv.1920, P. Vitalis de Salvaza; *Cavicoxum monstrosum* n.g., n.sp. [Pic]; Genre *Agraeus* selon Fleutiaux [Pic]; *Agraeus monstrosus* Pic, type, sub *Cavicoxum monstrosum* [Fleut.] (MNHN, Paris).

Other material examined. JAVA: *Agraeus monstrosus* [sic] Pic, sub *Cavicoxum* comparé au type [Fleut.], 1 ♀ (MNHN, Paris), 1 ♂, 1 ♀ (BMNH); G. Oengaran, vi.1907 (*Drescher*) 1 ♀; Djogjakarta (*C. J. Louwerens*), 1 ♂, 1 ♀; Afd. Tjiamis, xi.1901 (*Drescher*), 1 ♂ (ZM, Amsterdam). I have not examined the specimen from Java; Samarang determined as *monstrosum* Pic by Fleutiaux (1947).

### *Adelocera cylindriformis* Fleutiaux

*Adelocera cylindriformis* Fleutiaux, 1935b : 198; pl. 8, fig. 8.

LECTOTYPE (present designation). KENYA: ♂, Kenya, Lokitang, Turkana Nord, 750 m; Mission de l'Omo, C. Arambourg, P. A. Chappuis & R. Jeannel, 1932.33; *cylindriformis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. ETHIOPIA: ♂, Ethiopie Merid. Bourie [sic, published locality is Bourillé] Bord de la Riv. Omo, 600 m; Mission de l'Omo, C. Arambourg, P. A. Chappuis & R. Jeannel 1932-33. (MNHN, Paris).

Both specimens differ from the description in that the metasternal tarsal grooves do not attain the posterior lateral angles of the metasternum. The grooves are curved so that the distal end lies at a point near the lateral margin about two-thirds of the distance from the anterior margin of the metasternum.

### *Adelocera decipiens* (Boheman)

*Lacon decipiens* Boheman, 1851 : 417.

*Adelocera decipiens* (Boheman) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation. SOUTH AFRICA: ♀, Caffraria; J. Wahlb.; Typus: *decipiens* Boh. [Boh.] (NR, Stockholm).

The published locality is 'Terra Natalensi'. The absence of a more detailed locality label is discussed on p. 280. The metasternum is very short compared with species of similar size and appearance, such as the Indian *minusculus* (Candèze). This characteristic is generally associated with a reduction in the size of the wings. Unfortunately the wings have been destroyed by verdigris.

### *Adelocera demissus* (Candèze)

*Lacon demissus* Candèze, 1889 : 74.

*Lacon demissus* Candèze; Candèze, 1890 : 34.

*Lacon demissus* Candèze; Candèze, 1892c : 484.

*Adelocera demissus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: ♂, Bengale; Collection E. Candèze; *Lacon demissus* Cdz., det E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

Standing with the lectotype and paralectotype in the IRSNB are four specimens from the same locality, one of which bears Candèze's yellow-bordered determination label. These four specimens differ from the description and lectotype in that the elytra are distinctly striate. All eight specimens are mounted on cards but have pin-holes in the right elytra showing that they have been remounted. Since the elytral puncturation is clearly visible with the naked eye it is improbable that Candèze included these four in his original series. I believe that Candèze's determination label was replaced on the wrong specimen when the material was remounted. For this reason the general practice of designating the specimen bearing Candèze's determination label has not been followed.

Other material examined. INDIA: Chota Nagpur, 1 ♀, determined by Candèze (Candèze, 1890 and 1892c locality) (MNHN, Paris).

***Adelocera difficilis* (Lewis) sp. rev., comb. n.**

*Lacon difficilis* Lewis, 1894 : 29.

[*Lacon trifasciatus* Candèze; Candèze, 1873 : 1. Misidentification.]

[*Brachylacon microcephalus* Motschulsky; Kishii, 1961 : 25, pl. 2, figs 9, 10. Misidentification.]

LECTOTYPE (present designation). JAPAN: Sex undetermined, left hand of two specimens mounted on one card. 9.4.81 [on underside of card mount]; Japan, G. Lewis, 1910.320; Nagasaki, 13.ii-21.iv.81; *Lacon difficilis* Lewis, type [Lewis] (BMNH).

Paralectotypes: 1 ex., on card beside lectotype. 4 ♀ on one card, Nag. (on underside of card mount); Japan, G. Lewis, 1910.320. Nagasaki, 13.ii-21.iv.81; *Lacon difficilis* Lewis [Lewis] (BMNH).

Other material examined. JAPAN: Janson collection from Lewis, determined as *trifasciatus* by Candèze, 1 ex, (BMNH). This is probably part of the series misidentified by Candèze in 1873 and could be part of Lewis' syntype series of *difficilis*. I have not examined Kishii's material. The identification is based on the good figure of the aedeagus.

Fleutiaux (1918d : 194) treated *difficilis* Lewis as a synonym of *Lacon microcephalus* Motschulsky, but examination of the type-material of the two species has shown that he was mistaken. Up to the present time I have not seen any *difficilis* specimens from localities other than Japan, while *microcephalus* appears to be restricted to Ceylon (see p. 38).

Kishii (1961 : 25), Miwa (1933 : 29, 1934 : 70, 85) and Ohira (1934 : 10, 1968 : 73, 1969 : 94 & 1969c : 28) have recorded *microcephalus* Motschulsky from Japan. It is probable that re-examination of the material will show it to be *difficilis* Lewis.

***Adelocera dilatatus* (Fleutiaux) comb. rev.**

*Lacon dilatatus* Fleutiaux, 1903a : 572.

*Lacon dilatatus* Fleutiaux; Fleutiaux, 1918a : 208.

*Adelocera dilatatus* (Fleutiaux) Fleutiaux, 1926 : 96.

*Brachylacon dilatatus* (Fleutiaux) Fleutiaux, 1927 : 90.

*Brachylacon dilatatus* (Fleutiaux); Fleutiaux, 1947 : 254.

**LECTOTYPE** (present designation). NORTH VIETNAM: Laokay, (Tonkin); *Lacon dilatatus* Fleut., type [Fleut.]; *L. dilatatus* Fleut., type, Ann. Soc. Ent. Fr. 1902 p. 257 [Fleut.] (MNHN, Paris).

Other material examined. NORTH VIETNAM: Lac Tho., 1927, 2 ex., (Fleutiaux, 1927 locality) (MNHN, Paris); Vallee de la Haute Riv. Claire, between Hapiang [22°49'N., 104°48'E.] and Yikh-Tuy, 1 ♂ (Fleutiaux, 1947 locality) (MNHN, Paris).

***Adelocera discedens* (Candèze) comb. n.**

*Pericus discedens* Candèze, 1892 : 485.

*Pericus discedens* Candèze; Fleutiaux, 1905 : 320.

**LECTOTYPE** (present designation). INDIA: ♂, Bengale; n.sp. 1892, *discedens* Cand., Bengale, Barwai, P. Card. [Cand., yellow border]. Type; Collection E. Candèze. (IRSNB, Brussels).

Paralectotype. INDIA: 1 ex., Bengale; Collection E. Candèze *Agraeus discedens* det. E. Candèze [IRSNB curatorial label]. (IRSNB, Brussels).

The published type-locality is Sunk [Sank] Valley, July. For notes on the localities of Cardon's material see p. 273.

***Adelocera doherti* (Fleutiaux) comb. n.**

*Trachylacon doherti* Fleutiaux, 1935a : 17.

**LECTOTYPE** (present designation). INDIA: ♂, 61856. [Fry coll. catalogue = Margherita, Patkai Mts., under 2000 ft]. Doherty; Assam, Patkai Mts.; Fry coll. 1905.100, *Trachylacon doherti* Fleut., type [Fleut.] (BMNH).

Paralectotypes. INDIA: 1 ex., Doherty; India or., Manipur; Fry Coll. 1905.100 (BMNH). 1 ♂, Doherty; India or., Assam Valley; Fry Coll. 1905.100. (MNHN, Paris).

***Adelocera excavatus* (Fleutiaux) comb. n.**

*Agraeus excavatus* Fleutiaux, 1918a : 207.

*Agraeus excavatus* Fleutiaux; Fleutiaux, 1927 : 94; fig. and pl. 2, fig. 2.

*Agraeus coomani* Fleutiaux, 1927 : 97. **Syn. n.**

*Agraeus excavatus* Fleutiaux; Fleutiaux, 1931 : 74.

*Agraeus coomani* Fleutiaux; Fleutiaux, 1935a : 22.

*Agraeus excavatus* Fleutiaux; Fleutiaux, 1935a : 28.

*Agraeus excavatus* Fleutiaux; Fleutiaux, 1947 : 246.

*Agraeus coomani* Fleutiaux; Fleutiaux, 1947 : 248.

*Agraeus excavatus* Fleutiaux. Holotype. SOUTH VIETNAM: ♀, Cochinchine, Xa Rac, Province de Thaudamont, forets de Bambous, Capus; *Agraeus excavatus* Fleut., Type [Fleut.] (MNHN, Paris).

*Agraeus coomani* Fleutiaux. LECTOTYPE (present designation). NORTH VIETNAM: ♂, Tonkin, Lac Tho, Hoa Binh, A. de Cooman; Type; *Agraeus coomani* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes: 14 ♂, with same locality as lectotype; 7 ex. bear Fleutiaux's determination labels and one an additional label in Fleutiaux's hand 'type de la figure', (MNHN, Paris). 1 ♂, same locality as lectotype, with Fleutiaux's determination label (BMNH).

Other material examined. NORTH VIETNAM: Lac Tho, 5 ♀ (MNHN, Paris), 1 ♂ (BMNH) (Fleutiaux, 1931, locality). LAOS: Kieng Khouang, iv.1964, 2 ♂ (BMNH). BURMA: Karen Hills, Thandaung, 1 ♂ (Fleutiaux, 1935a, locality) (BMNH). INDIA: Ranikhet Divn. [29°38'N., 79°28'E.] Kumaon, vii. 1921, 1 ♂ (BMNH).

### *Adelocera exiguus* (Candèze)

*Lacon exiguus* Candèze, 1897 : 10.

*Adelocera exiguus* (Candèze), Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). BORNEO: ♂, Bangwey [Banggi] Borneo; n.sp. 1895, *exiguus* Cand., 1. Bangwey St. [Cand., yellow border] *Lacon exiguus* Cd., det. E. Candèze [IRSNB curatorial label]; Type (IRSNB, Brussels).

Other material examined. BORNEO: Bangwey, 3 ex. (MNHN, Paris).

The lectotype differs from the description in that it measures 3 mm in length and 1 mm in width compared with Candèze's measurements of 1 3/4 mm and 2/3 mm. In addition the elytra are striate and tarsal grooves are present on the propleurae and metasternum. However, I have no doubt that this is the material on which Candèze based his description. His errors are almost certainly due to the very small size of the specimen.

### *Adelocera falsus* (Fleutiaux) **comb. n.**

*Agraeus falsus* Fleutiaux, 1927 : 97, fig. and pl. 2, fig. 27.

[*Agraeus mouhoti* Candèze; Fleutiaux, 1918d : 188. Misidentification.]

*Agraeus falsus* Fleutiaux; Fleutiaux, 1947 : 248.

LECTOTYPE (present designation). NORTH VIETNAM: ♂, Tayninh, 6.10; Capitaine Fouguet; *mouhoti* Cand., [Fleut., crossed out]; *A. falsus* Fleut., type, *mouhoti* Fleut., non Cand. [Fleut.] (MNHN, Paris).

Paralectotypes. SOUTH VIETNAM: 1 ♂, Cochinchine, Mont de Chaudoc, Harmand, 1887; *Agraeus mouhoti* Cand. [Fleut.]; *Agraeus falsus* Fleut. non Cand. [Fleut.] (MNHN, Paris). 1 ♂, Cochinchine, Cap St. Jaques, collection Cordier; *A. falsus* n. sp. Blair, Brit. Mus. 1929 [Fleut.]; type de la figure [Fleut.] (MNHN, Paris).

At the present time the female of this species is unknown. By analogy with species whose males resemble *falsus* Fleutiaux (e.g. *excavatus* Fleutiaux, *lobicollis* Motschulsky) it seems probable that the prothorax of the female has strongly modified anterior angles.

*Adelocera feai* (Fleutiaux) **comb. n.**

*Agraeus feai* Fleutiaux, 1935a : 23.

[*Agraeus mouhoti* Candèze; Candèze, 1888 : 671 pars, ♂ not ♀ as recorded. Misidentification.

Synonymized by Fleutiaux, 1935a : 23.]

[*Agraeus mouhoti* Candèze; Candèze, 1891a : 755 pars. Misidentification. Synonymized by Fleutiaux, 1935a : 23.]

LECTOTYPE (present designation). BURMA: ♂, Maymyo, vi.10. H. L. Andrewes; Maymyo, Birmanie; Andrewes; *feai* Fleut., type [Fleut]; *feai* n.sp. [Fleut.] (MNHN, Paris).

Paralectotypes. BURMA: 1 ♂, Maymyo v.10. H. L. Andrewes; *Agraeus feai* Fleut. [Fleut.]; *feai* n.sp. *mouhoti* Cand. 1888 (non 1874) [Fleut.]. (BMNH). 1 ♂, Maymyo. v.10. H. L. Andrewes (BMNH). 1 ♂, Maymyo, vi.10. H. L. Andrewes (BMNH). 1 ♂, Carin Cheba [see p. 275]. 900–1,000 m L. *Fea* v.xii.88; *Agraeus mouhoti* ♀ [Cand.] Collection E. Candèze; non *mouhoti* Cand. 1874 sec Fleut. 1934 [Fleut.]; *Agraeus feai* Fleut., *mouhoti* Cand. 1888 non Cand., 1874. 1934 [Fleut.], (Candèze; 1891 locality) (IRSNB, Brussels). 1 ♂, Tenasserim, Thagata [position unknown]. *Fea*, Apr. 1887; coll. Schwarz; *Agraeus mouhoti* Cand.; *Agraeus feai* Fleut. [Fleut.]. (Candèze; 1888 locality) (DEI, Eberswalde). INDIA: 1 ♂, Gopaldhara, Rungabong Vall. [position unknown] Sikkim, H. Stevens. (BMNH). 1 ♂, Shillong, Assam, F.W.C.; *Agraeus* sp. near *Lacon* [Champ.]; *feai* Fleut. [Fleut.]. (BMNH). 1 ♂ Assam Valley; Doherty; 61880 [Fry collection catalogue = March to Kohima from country] Fry coll. 1905.100; *Agraeus feai* Fleut. [Fleut.] (BMNH). 1 ♂, Assam, Patkai Mts; 61060 [Fry collection catalogue = Patkai Mts, under 2000 ft]; Fry coll. 1905. 100 (BMNH). 1 ♂, Assam, Patkai Mts; Doherty; Fry Coll. 1903. 100 (BMNH). 1 ♂, C. Almora Divn. Kumaon, U.P. July 1921, H.G.C.; *feai* Fleut. (Brit. Mus.) [Fleut.] (MNHN, Paris). 4 ♂, C. Almora Divn Kumaon, U.P. July '20, H.G.C. One specimen bears Fleutiaux's determination label. (BMNH). 1 ♂, C. Almora, Kumaon, India. H.G.C. (BMNH). 1 ♂, Berenang [position unknown] 6000', Almora Dt. U.P. R.N. Parker, 30 vi.1923; *feai* Fleut, Mus. Dehra Dun [Fleut.] (MNHN, Paris). 1 ♂, Kulu [position unknown, possibly Punjab, Kangra district 32°09'N., 76°15'E.] 3600 Fuss; Kulu, Himalaya (MNHN, Paris).

Other material examined. INDIA: Ranikhet, Kumaon, 1 ♂ (MNHN, Paris); Dehra Dun, on grass, 10.vii.1912, 1 ♂ (MNHN, Paris); Dehra Dun, Kaulagarh, 7 ♂ (MNHN, Paris); Dehra Dun, New Forest, 28.ix.1929, 1 ♂. (FRI, Dehra Dun).

The identification of Fleutiaux's syntype material was not a simple task. Fleutiaux did not record the localities on the labels on the specimens. Instead he listed Birmanie, Tenasserim, Sikkim, Assam, Almora and Kulu as the regions from which his material was obtained. Fortunately his collection contains a specimen labelled 'type' and others with his determination labels and this enabled me to assemble a syntype series from localities within the regions recorded by Fleutiaux. Specimens from type-localities but without determination labels have been included in the syntype series if they stood as *feai* in collections mentioned by Fleutiaux.

The inclusion of certain specimens from Thagata and Carin Cheba in the syntype-series requires an explanation. Fleutiaux lists *A. mouhoti* Candèze, 1888 : 671

pars as a synonym of *feai*, indicating in a footnote that the material is in the DEI, Eberswalde (formerly in Berlin-Dahlem). The only specimen in that collection from Thagata labelled *mouhoti* (though not by Candèze) and correctly determined as *feai* by Fleutiaux is a male. The specimen agrees very well with Candèze's description of *mouhoti* ♀ and is assumed to be one of the three specimens (misidentified as 1 ♀, 2 ♂) recorded by Candèze (1888). For the other two specimens (2 ♀) see *lobicollis* Motschulsky, other material examined, p. 36.

Fleutiaux's footnote also refers to *A. mouhoti* material (number of specimens not recorded) from Carin Cheba, 9 à 1,100 m, mai à decembre (Fea) apparently also recorded by Candèze, 1888 in the IRSNB, Brussels. Candèze did not record *mouhoti* from Carin Cheba until 1891 (1891a; 775, 3 ♀). A male from this locality in the IRSNB, Brussels labeled *Agraeus mouhoti* ♀ by Candèze has been correctly identified as *A. feai* ♂ by Fleutiaux. The remaining two specimens (?MCSN, Genoa) have not been examined. As Candèze appears to have misidentified the sexes it seems probable that these two specimens will be found also to be male *feai* Fleutiaux.

#### *Adelocera feroculus* (Candèze) **comb. n.**

*Agraeus feroculus* Candèze, 1874 : 105.

*Agraeus feroculus* Candèze; Fleutiaux, 1935a : 25.

Lectotype (designated by Fleutiaux, 1935a). SUMATRA: ♂, C.W., Sumatra; Sum.; Janson coll., 1903 : 130; ex Coll. Wallace [Janson]; *Agraeus feroculus* Candèze, type [Janson]; *feroculus* Cdz., type [Cand.] (BMNH).

#### *Adelocera fleutiauxi* **nom. n.**

*Prolacon alluaudi* Fleutiaux, 1934d : 197.

*Adelocera alluaudi* (Fleutiaux) **comb. n.** [Junior secondary homonym of *Adelocera alluaudi* Fleutiaux, 1919.]

LECTOTYPE (present designation). IVORY COAST: ♂, Assinie Cote occid. Afrique, Ch. Alluaud, 1886: *Prolacon alluaudi* Fleut., type [Fleut] (MNHN, Paris).

Paralectotypes. ZAIRE: 1 ♂, Museum Paris, Congo Belge Central, Prov. de Maniema, Kindu, L. Burgeon 1917; *Prolacon alluaudi* Fleut. [Fleut.] (MNHN, Paris). CAMEROUN: 1 ♀, Museum Paris, Cameroun, vers le Nord. Dr. Gromier, 1917 (MNHN, Paris).

This species, the type-species of *Prolacon*, is discussed on p. 16.

#### *Adelocera fryi* (Fleutiaux) **comb. n.**

*Agraeus fryi* Fleutiaux, 1935a : 28.

Holotype. INDIA: ♀, 61053 [Fry coll. catalogue = Assam, Margherita, Patkai Mts, under 2000 ft]; Doherty, Assam, Patkai Mts.; Fry coll. 1905.100; *Agraeus fryi* Fleut., type [Fleut] (BMNH).

Fleutiaux (1942 : 3) records this species from North East Burma, Sadon. The NR.

Stockholm possesses a female from this locality bearing Fleutiaux' determination label 'Agraeus fryi Fleut.? type unique in Brit. Mus.' It is not conspecific with the lectotype, lacking the long setae on the elytra. It belongs to a species unknown to me.

***Adelocera fulvicollis* (Motschulsky) comb. n.**

*Trochylacon* [sic] *fulvicollis* Motschulsky, 1858 : 61.

*Agraeus fulvicollis* (Motschulsky) Schwarz, 1906 : 28.

[*Pericus variegatus* Schwarz; Fleutiaux, 1918a : 207. Misidentification.]

[*Pericus variegatus* Schwarz; Fleutiaux, 1918b : 188. Misidentification.]

[*Trachylacon variegatus* (Schwarz) Fleutiaux, 1927 : 89. Misidentification.]

*Trachylacon distinctus* Fleutiaux, 1935a : 14. **Syn. n.**

*Trachylacon distinctus* Fleutiaux; Fleutiaux, 1947 : 250.

*Trachylacon fulvicollis* Motschulsky. **LECTOTYPE** (present designation). ♂, yellow circle with illegible manuscript; *Trachylacon fulvicollis* Motsch., Ind. or.; *Trachylacon fulvicollis* Motsch. Sept. 1932, Fleutiaux vid [Fleut.] (ZMU, Moscow).

Paralectotype. ♂, on same card as the lectotype (ZMU, Moscow). The specimens are mounted, line ahead, on one card. The specimen furthest from the pin has been selected as the lectotype.

Motschulsky does not record the locality of this species. It is probably part of the material from the 'continent indien' to which he refers in the paragraph preceding the description.

*Trachylacon distinctus* Fleutiaux. **LECTOTYPE** (present designation). **NORTH VIETNAM:** ♂, Hoa Binh, P. Cooman; Hoa Binh, Tonkin, de Cooman; *Trachylacon distinctus* Fleut., type [Fleut.] (MNHN, Paris). Fleutiaux records the type locality as Hoa Binh, Lac Tho. His series (see below) includes specimens without determination labels from this locality. However as this specimen agrees so well with the description and bears his type label, I have assumed that the discrepancy between the published locality and the label is due to an oversight by Fleutiaux.

Paralectotypes **NORTH VIETNAM:** 4 ♂, 2 ♀, Tonkin, Lac Tho, Hoa Binh, A. de Cooman. 1 ♂, Choganh, Tonkin, 4. 1916; Tonkin, Cho Ganh, L. Dupont; *Pericus variegatus* Schw. 1918 [Fleut.]. *Trachylacon distinctus* Fleut. [Fleut.]. 1 ♂, Museum Paris, Lachon [sic, published locality Lakhon] Harmand, 1878; *Pericus variegatus* ? ♂ Schwarz, 1917 [Fleut.] *Trachylacon distinctus* Fleut., Punctuation d'elytres [remainder illegible] [Fleut.]. 1 ♂, Museum Paris, Tonkin Central, Env. de Tuyen Quan, A. Weiss, 1901; *Pericus variegatus* Schw. ♀? Fleut. Bull. Mus. 1918 [Fleut.]; *distinctus* Fleut. [Fleut.]. 1 ♀, Reg. de Luc Nam (Tonkin), L. Blaise; Coll. Ph. Francois, Coll. L. Bedel; *Trachylacon variegatus* Schw., Fleut., 1918, 1927 [Fleut.]; *distinctus* Fleut. 1935 [Fleut.]. 2 ♀, same locality without determination labels (MNHN, Paris).

Other material examined. **NORTH VIETNAM:** Thakek, 1 ♂ (MNHN, Paris); Hoa Binh, viii.1918, 1 ♂, (BMNH). **HONG KONG:** 1 ♂ (BMNH). **BURMA:** 1 ♂ (BMNH).

***Adelocera gibberosus* (Fleutiaux) comb. n.**

*Agraeus gibberosus* Fleutiaux, 1935a : 29.

Holotype. MALAYA: ♀, Malaya, Kuala Lumpur, 14 Mile, S. Buloh, May 25th, 1932. H. M. Pendlebury, Ex. Coll. F.M.S. Museum; Brit. Mus. 1934 : 80; *Agraeus* sp. G. E. Bryant det; *Agraeus gibberosus* Fleut., type [Fleut.] (BMNH).

***Adelocera hilaris* (Candèze)**

*Lacon hilaris* Candèze, 1891a : 744.

*Adelocera hilaris* (Candèze) Fleutiaux, 1926 : 96.

The description is based on a single specimen (MCSN, Genoa) collected in Carin Cheba (see p. 275) in December 1888 by Fea.

The inclusion of *hilaris* Candèze in *Adelocera* is tentative, based on Candèze's comment that it is 'comme le precedent' which is *trifasciatus* Candèze (= *Adelocera microcephalus* Motschulsky, see p. 38).

***Adelocera incisus* (Fleutiaux) comb. n.**

*Brachylacon incisus* Fleutiaux, 1940b : 32.

*Brachylacon incisus* Fleutiaux; Lesne, 1940 : 36.

LECTOTYPE (present designation). BORNEO: ♀, Sandakan, Borneo, Baker; *Brachylacon incisus* Fleut., type [Fleut.] (MNHN, Paris).

The lectotype differs from the description in that the prosternal process is not grooved, though there is a slight depression between the anterior coxae. The metepisterna are not parallel-sided but triangular and not visible beyond a point just posterior to the distal end of the metasternal tarsal groove. It would appear that Fleutiaux misinterpreted the longitudinal carinae on the epipleurae as the suture between the metepisterna and the epipleurae (see also *P. alluandi*, p. 16).

***Adelocera indicus* (Fleutiaux) comb. n.**

*Agraeus indicus* Fleutiaux, 1935a : 22.

LECTOTYPE (present designation). INDIA: ♂, Nilgiri Hills; 1280; Andrewes, *indicus* Fleut., type [Fleut.], *indicus* n.sp. [Fleut.] (MNHN, Paris).

Paralectotypes. INDIA: 1 ♂, Nilgiri Hills, H.L. [sic] Andrewes, *Agraeus indicus* Fleut. [Fleut.] (BMNH). 1 ♂, Nilgiri Hills (BMNH).

Fleutiaux records the locality as 'Nilgiri Hills, Ouchterlony Valley, 3-500 ft, fevrier et aout, en battent les abres (H. C. Andrewes), coll. H. E. Andrewes.' I have not been able to discover a specimen bearing this information. It is possible that the number 1280 on the lectotype refers to a list of localities and biological data which is now lost.

***Adelocera kilimandjarensis* (Fleutiaux)**

*Lacon kilimandjarensis* Fleutiaux, 1919 : 17.

*Adelocera kilimandjarensis* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). TANZANIA: ♂, Afrique or. allemande, Kilimandjaro versant sud-est, Alluaud & Jeannel; Zone inferieure, Neu Moschi 800 m. Avril, 1912, st.72; *Lacon kilimandjarensis* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes. 11 ex., same locality as lectotype, 3 of these bear Fleutiaux's determination labels and one is in addition marked 'Co-type' on the determination label (MNHN, Paris). 1 ♂, same locality as lectotype with Fleutiaux's determination label (BMNH).

The specimen, a male from Shimoni, regarded as a local form by Fleutiaux is in the MNHN, Paris. It is correctly identified.

***Adelocera laxus* (Candèze)**

*Lacon laxus* Candèze, 1874 : 85.

*Adelocera laxus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. NEW GUINEA: ♀, Mysole [Misoöl]; *laxus* Cdze, type [Cand.]; *Lacon laxus* Cand., type Mysol [Janson] (BMNH).

The BMNH also possesses the second specimen, a male, tentatively associated with this species by Candèze. It is impossible at the present time to decide whether these specimens are the male and female of the same species.

***Adelocera lobicollis* (Motschulsky) comb. n.**

*Trachylacon lobicollis* Motschulsky, 1858 : 61.

*Agraeus mouhoti* Candèze, 1874 : 106. [Synonymized by Fleutiaux, 1932e : 79.]

[*Agraeus mouhoti* Candèze; Candèze, 1888 : 671, pars. Misidentification.]

*Agraeus lobicollis* (Motschulsky) Schwarz, 1906 : 28.

*Agraeus duporti* Fleutiaux, 1918d : 187. [Synonymized with *mouhoti* Candèze, Fleutiaux, 1926 : 100.]

*Agraeus tonkinensis* Fleutiaux, 1927 : 94. **Syn. n.**

*Agraeus mouhoti* Candèze; Fleutiaux, 1927 : 96; pl. 2. fig. 40.

*Agraeus lobicollis* (Motschulsky); Fleutiaux, 1932e : 79.

*Agraeus lobicollis* (Motschulsky); Fleutiaux, 1935a : 21.

*Agraeus tonkinensis* Fleutiaux; Fleutiaux, 1935a : 27.

*Agraeus tonkinensis* Fleutiaux; Fleutiaux, 1947 : 246.

*Agraeus lobicollis* (Motschulsky); Fleutiaux, 1947 : 247.

*Trachylacon lobicollis* Motschulsky. LECTOTYPE (present designation). ♂, Ind. or.; *Trachylacon lobicollis* Motsch. Ind. or. [Motch]; Sept. 1932, Fleutiaux det. [Fleut] (ZMU, Moscow).

Paralectotype: ♂, yellow paper circle; *Trachylacon lobicollis* Motsch. Ind. or.; Sept. 1932, Fleutiaux det. [Fleut] (ZMU, Moscow).

The country of origin is unknown. It is probably Burma, Malaya, Thailand or Indochina.

*Agraeus mouhoti* Candèze. LECTOTYPE (present designation). THAILAND:

♂, Siam, Pachebon [sic] Muhot; Janson coll. 1903. 130; *A. muhoti* [sic] Cdze, type [Cand.]; *Agraeus muhoti* [sic] Cdze, type [Janson] (BMNH).

Paralectotype. ♂, Pachebon, Muhot; Janson coll. 1903.130; *Agraeus mouhoti* [Cand.]; *Agraeus muhoti* [sic] Cdze., Cand [Janson]; *lobicollis* Mot. mouhoti Cand, 1874 *duporti* Fleut. [Fleut.] (BMNH).

The published locality is Pechabury [? Phet Buri]. I have not been able to trace the specimens recorded from the Saunders collection (see p. 279).

*Agraeus duporti* Fleutiaux. LECTOTYPE (present designation). NORTH VIETNAM: ♂, Cho-Ganh, 5-14; Tonkin, Cho-Ganh, L. Duport; *Agraeus duporti*, type [Fleut.] (MNHN, Paris).

Paralectotypes. NORTH VIETNAM: 4 ♂, Tonkin, Cho Ganh, L. Duport; *Agraeus duporti* Fleut. [Fleut.]. 2 ♂, Tonkin, Cho Ganh, L. Duport. *Agraeus duporti* Fleu. [Fleut.]; Juin. 1 ♂ Cho Ganh, L. Duport. Juin 6 ♂, Tonkin, Cho Ganh, L. Duport (MNHN, Paris) 2 ♂, Tonkin, Cho Ganh, L. Duport; *Agraeus duporti* Fleut. [Fleut.] (BMNH).

*Agraeus tonkinensis* Fleutiaux. LECTOTYPE (present designation). NORTH VIETNAM: ♀, Tonkin, Cho Ganh, L. Duport; *Agraeus tonkinensis* Fleut; type [Fleut.] (MNHN, Paris).

Paralectotypes. NORTH VIETNAM: 1 ♀, Tonkin; Cho Ganh, L. Duport; *tonkinensis* Fleut. [Fleut.]; type de la figure [Fleut.] (MNHN, Paris). 1 ♀, Tonkin, Hoa-Binh. August 1918. R. V. de Salvaza; Indo-China, R. V. de Salvaza 1918. 1; *Agraeus tonkinensis* Fleut. [Fleut.] (BMNH). 1 ♀, Luc Nam, Blaise; *Agraeus tonkinensis* Fleut. [Fleut.] (MNHN, Paris).

Every known specimen determined as *tonkinensis* Fleutiaux has been found to be female. The belief that *tonkinensis* is the female of *lobicollis* is based on the series from Lac Thô (see below) which consists of males corresponding with *lobicollis* and females corresponding to *tonkinensis*.

Other material examined. BURMA: 1 ♀, Tenasserim, Thagata, Fea, April, 1887; *agraeus mouhoti*; *Agraeus tonkinensis* Fleut. [Fleut.] (Fleutiaux, 1935a : 27 and Candèze, 1888 : 671 locality) (MCSN, Genoa). 1 ♀, Tenasserim, Thagata, Fea, April, 1887, *Agraeus mouhoti* Cand.; *mouhoti* Cdz. Tenasserim [Cand, yellow border]; Collection E. Candèze; *mouhoti* Cand. type Ann. Gen. 1888 [Fleut.]; *Agraeus lobocollis* Mots., *mouhoti* Cand., *duporti* Cand. [Fleut.] *mouhoti* Cand., type revis. ex. coll. Janson in Brit. Mus. Siam [Fleut.] (Candèze, 1888 : 671, locality) (IRSNB, Brussels). NORTH VIETNAM: Hoa Binh, Lac Thô, 62 ♂, 20 ♀ (MNHN, Paris); 6 ♂ (BMNH); 3 ♂ (DEI, Eberswalde); N. Annam, Prov. Thanh Hoa, v. 42, 1 ♂ (MNHN, Paris); Cochinchina, Laithe Bencat, v. 45, 3 ♂ (MNHN, Paris); Lakhon, 2 ♂ (MNHN, Paris). THAILAND: 17.vi.1936, 1 ♂ (MNHN, Paris).

Candèze (1891a : 775) recorded 3 ♂ collected by Fea in Carin Cheba, 9 à 1, room, mai à décembre. One specimen from this locality labelled *Agraeus mouhoti* ♀ by Candèze has been located in the IRSNB, Brussels. It has been correctly identified as *A. feai* Fleutiaux ♂ and is a paralectotype of that species (see p. 31). The remaining two specimens (? MCSN, Genoa) have not been examined.

***Adelocera lucasseni* (Candèze) comb. n.**

*Agraeus lucasseni* Candèze, 1893a : 125.

*Trachylacon lucasseni* (Candèze) Fleutiaux, 1927 : 88. [Tentative transference.]

*Agraeus lucasseni* Candèze; Fleutiaux, 1935a : 25; fig.

Holotype. JAVA: ♂, Mr. Th. Lucassen, Simpar, 3000 v.Tegal. Java 10, 1890; Type; *Agraeus lucasseni* Cand. n.sp.♂ [Cand.]; Holotype: Van Zwaluwenburg July 1957 (RNH, Leiden).

***Adelocera luzonicus* (Fleutiaux) comb. n.**

*Trachylacon luzonicus* Fleutiaux, 1935a : 17.

Holotype. PHILIPPINES: ♀, Luzon, Mont Banahao; *Trachylacon luzonicus* Fleut., type [Fleut.] (MNHN, Paris).

***Adelocera macarthuri* (Fleutiaux) comb. n.**

*Lacon macarthuri* Fleutiaux, 1935c : 91.

LECTOTYPE (present designation). KENYA: ♂, McArthur, Hola, Tana Riv., Nov. 1933; *Lacon* (*Adelocera*) *macarthuri* Fleut., type [Fleut.] (MNHN, Paris).

Other material examined. SOMALI REPUBLIC: Bidi Scionde, Baso Guita, 1 ♀ (MNHN, Paris).

***Adelocera maculosus* (Candèze) comb. n.**

*Agraeus maculosus* Candèze, 1893a : 125.

*Trachylacon maculosus* (Candèze) Fleutiaux, 1927 : 88.

*Trachylacon maculosus* (Candèze); Fleutiaux, 1935a : 16.

The description is based on a single specimen from Java, Kalibakoeng (*Lucassen*) in the RNH, Leiden. The curator, Dr Wiebes, has informed me that it cannot be found, nor is there any record of the type ever having been in that collection. Fleutiaux (1935a) states that the type is in the RNH, Leiden but it seems probable that he mistook the specimen from Palambuan (see below) for the type. Candèze may have retained the specimen (see p. 271) and if this is so, it should be in the IRSNB, Brussels.

The generic attribution is based on the three specimens recorded below.

Material examined. JAVA: Java merid., Palambuan, 1892, H. Fruhstorfer; *Agraeus maculosus*; Gen. *Trachylacon* Mots. [Fleut.], 1 ♂. Samarang, Nov. 1919, 1 ♂ (RNH, Leiden). Sukabumi, 1 ♂. Tiji Wynkoopsbaai, 1 ♂ (Fleutiaux, 1935a, localities) (MNHN, Paris).

***Adelocera mannerheimii* (Candèze) comb. n.**

*Agraeus mannerheimii* Candèze, 1857 : 166, pl. 3, fig. 4.

*Agraeus cuniculus* Candèze. 1874 : 105. **Syn. n.**

*Agraeus ritsemai* Candèze, 1883 : 204. [Synonymized with *mannerheimii* Candèze by Fleutiaux, 1935a : 26.]

*Agraeus mannerheimi* [sic] Candèze; Fleutiaux, 1935a : 26.

*Agraeus mannerheimii* Candèze. LECTOTYPE (present designation). ♀, India (Janson); Janson Coll. 1903 : 130; ex. coll. Dejean [Janson]; *Agraeus mannerheimi*, type Dj. Cdze [Janson] (BMNH).

Candèze records the locality as Java and comments 'Je ne l'ai vu que dans la collection de M. de la Ferté Senectère portant le nom que je lui conservé et sous laquelle il a été donné par M. Boheman au conte Dejean'. (For notes on the Laferté Senectère and Dejean collections see pp. 276 and 274.) The absence of the original determination label and the locality 'India' is probably due to Janson (see p. 276) I have not seen any other specimens of this species from India.

*Agraeus cuniculus* Candèze. LECTOTYPE (present designation). MALAYA: ♀, C. W. Singapore [Janson]; Sing.; Janson Coll. 1903 : 130; *A. cuniculus* Cdze., type [Cand.]; ex. coll. Wallace; *Agraeus cuniculus* Cdze. type [Janson] (BMNH).

*Agraeus ritsemae* Candèze. LECTOTYPE (present designation). JAVA: ♂, *Agraeus ritsemae* Cdze., type [Cand.]; Hulié, Java (RNH, Leiden).

Candèze believed that *ritsemae* might be the female of *mannerheimii*, which is not surprising since he was unaware of the very unusual form of sexual dimorphism (see p. 21) shown by this species. Fleutiaux (1935a : 26) identified the sexes correctly.

Other material examined. JAVA: Bogor, 20.xii.1953, 1 ♀ (BMNH). BORNEO: Martapura, 1 ♂ (BMNH). SUMATRA: Mirang, 1 ♂ (BMNH). PHILIPPINES: N. Palawan, Binaluan, 1 ♀ (MNHU, Berlin). MALAYA: Singapore, 1 ♂, 6 ♀ (BMNH). Kuala Lumpur, iv. 1931, ix. 1932, viii. 1922, 3 ♂ (BMNH); S. Perak, Kintra Valley, ix, x, 1 ♀ (BMNH); W. Coast Langkawi Is., iv. 1928, 1 ♂, 1 ♀ (BMNH).

I have not seen the specimen from Sumatra, Serdang in the RNH, Leiden recorded by Candèze (1883 : 205) or the material from Singapore (*Biro*) in the TM, Budapest recorded by Szombathy (1909 : 120).

### *Adelocera microcephalus* (Motschulsky) **comb. rev.**

*Brachylacon microcephalus* Motschulsky, 1858 : 60.

*Brachylacon microcephalus* Motschulsky; Motschulsky, 1861 : 118.

*Lacon trifasciatus* Candèze, 1865 : 10. [Synonymized by Candèze, 1891c : 24.]

*Lacon microcephalus* (Motschulsky) Gemminger & Harold, 1869 : 1993.

*Brachylacon microcephalus* Motschulsky; Fleutiaux, 1925 : 207.

*Adelocera microcephalus* (Motschulsky) Fleutiaux, 1926 : 96.

*Brachylacon microcephalus* Motschulsky; Fleutiaux, 1947 : 252.

*Brachylacon microcephalus* Motschulsky. LECTOTYPE (present designation). CEYLON: ♀, grey paper square; yellow circle with illegible writing; *Brachylacon microcephalus* Motsch. Mt. Nura Ellie, Ceylon [Motschulsky]; Sept. 1932. Fleutiaux vid. [Fleut.] (ZMU Moscow).

Paralectotype. ♀, head and prothorax lost; bears a grey square and yellow circle, similar to those on the lectotype (ZMU, Moscow).

*Lacon trifasciatus* Candèze. LECTOTYPE (present designation). CEYLON: ♀,

Ceylon, Janson coll. 1903 : 130; *Lacon trifasciatus* Cdz., Ceylon (Cand.); *Lacon trifasciatus* Cand., ex coll. Cand. [Janson] (BMNH).

Candèze (1891 : 24) listed *microcephalus* Motschulsky as a synonym of *trifasciatus* Candèze, disregarding the fact that Motschulsky's description was published seven years before his own. Fleutiaux (1918d : 194) corrected the synonymy.

Other material examined. CEYLON: 1 ♂ (ex Fry coll.), 2 ♀ (ex Janson Coll.); Dikoya, 3,800–4,200 ft, 21.i–7.ii.82 (*Lewis*), 2 ♂, one with Lewis's determination label: *Lacon trifasciatus* Cand. (BMNH).

*Lacon microcephalus* Motschulsky has been recorded from many other localities. The following specimens have been examined and found not to be conspecific with the lectotype; they belong to a number of different species unknown to me. INDIA: Chota Nagpur (Candèze, 1892 : 485, as *trifasciatus* Candèze), 1 ♀ (determined by Candèze), 2 ♂ (MNHU, Berlin); 14 ex., one labelled '*trifasciatus* teste Cand.' (MNHU, Paris); 1 ex. (BMNH); Frazerpet, Coorg (Fleutiaux, 1933 : 3), 1 ♂ (FRI, Dehra Dun). BURMA: Tienzo [position unknown] (Candèze, 1888 : 91, as *trifasciatus* Candèze), 1 ex. (MCSN, Genoa). MALAYA: Malacca (Fleutiaux, 1918d : 194), 3 ♀ (MNHN, Paris). CAMBODIA: (Fleutiaux, 1927 : 92) 9 ex. (MNHN, Paris). NORTH VIETNAM: Hoa Binh, Lac Tho (Fleutiaux, 1927 : 92), 10 ex. (MNHN, Paris); Region de Luc Nam (Fleutiaux, loc. cit.), 1 ex. (MNHN, Paris). BORNEO: (Candèze, 1892c : 485, as *trifasciatus* Candèze and Fleutiaux, 1918d : 194) 3 ex. (MNHN, Paris). PHILIPPINES: (Fleutiaux, 1916 : 220, as *trifasciatus* Candèze, and 1918d : 194) Luzon, Mt Maquiling, 8 ex. (MNHN, Paris); Mindanao, 1 ex. (MNHN, Paris); Butan, 1 ex. (MNHN, Paris); Palawan, 1 ex. (MNHN, Paris).

I have not examined the specimens recorded from Sikkim and Bengal (Candèze, 1892 : 485), Burma, Palon (Candèze, 1891a : 777), Sumatra, Si Rambe (Candèze, 1894 : 486), S. Vietnam, Cochinchina (Candèze, 1892 : 485), Japan, Formosa, Korea and Tsushima Island (Miwa, 1933 : 27, 29, 1934 : 70, 185, Kishii, 1961 : 25, Ohira, 1968a : 73, Ohira, 1969c : 28).

Up to the present time all the specimens of *microcephalus* Motschulsky known to me are from Ceylon. It seems probable that the species is restricted to that island.

### *Adelocera minusculus* (Candèze)

*Lacon minusculus* Candèze, 1874 : 68.

*Adelocera minusculus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: ♂, Bombay: *L. minusculus* Cdz., type [Cand.]; Janson Coll. 1903 : 130; *Lacon minusculus* Cand., type [Gahan] (BMNH).

Paralectotype. INDIA: ♀, Bombay; Janson Coll. 1903.130 (BMNH).

### *Adelocera minutus* (Candèze) **comb. n.**

*Dilobitarsus minutus* Candèze, 1878a : LII (6).

LECTOTYPE (present designation). BRAZIL: ♂, Bahia, Reed; n.sp. *minutus*

Cdz. Br. [Cand.]; Collection E. Candèze; Dilobitarsus minutes det. E. Candèze [IRSNB curatorial label]; ex typis (IRSNB, Brussels).

***Adelocera nanus* (Boheman)**

*Lacon nanus* Boheman, 1851 : 420.

*Lacon troglodytes* Boheman, 1851 : 419. [Synonymized by Candèze, 1857 : 131.]

*Lacon nanus* Boheman; Candèze, 1874 : 56.

*Adelocera nanus* (Boheman) Fleutiaux, 1926 : 96.

*Lacon nanus* Boheman. LECTOTYPE (present designation). SOUTH AFRICA: ♂, Caffraria; J. Wahlb.; Type; nanus [Boh.] (NR, Stockholm).

The published locality is 'Habitat in terra Natalensi'. The localities of Boheman's material are discussed on p. 280. The specimen agrees with the description though it is slightly larger in size, measuring 3.7 mm in length and 1.5 mm in width compared with Boheman's measurements of  $3\frac{1}{4}$  and 1 mm.

*Lacon troglodytes* Boheman. LECTOTYPE (present designation). SOUTH AFRICA: ♀, Caffraria; J. Wahlb; troglodytes Bhm. Ins. Caffr. [Boh.] (NR, Stockholm).

The published locality is 'Habitat in tractibus fluvii Gariepis'. The localities of Boheman's material are discussed on p. 280. The specimen agrees reasonably well with the description though it is slightly larger, measuring 4 mm in length and 1.5 mm in width compared with Boheman's measurements of  $3\frac{3}{4}$  mm and  $1\frac{1}{4}$  mm.

I believe these specimens are the male and female of the same species and that Candèze was fully justified in placing them in synonymy. Candèze used the name *nanus* although *troglodytes* has page-precedence. However his action, as first reviser, must be accepted.

Other material examined. SOUTH AFRICA: Zululand, 4 ♀ (BMNH). One specimen bears Candèze's determination label 'nanus' and is probably the 'jolie varietie' of Candèze (1874 : 56).

***Adelocera nebulosa* (Candèze) comb. rev.**

*Lacon nebulosus* Candèze, 1857 : 115.

*Lacon nebulosus* Candèze; Candèze, 1874 : 84.

*Adelocera nebulosus* (Candèze) Fleutiaux, 1926 : 96.

*Brachylacon nebulosus* (Candèze) Fleutiaux, 1942 : 3.

LECTOTYPE (present designation). CEYLON: ♂, Ceylon; Janson coll. 1903 : 130; *Lacon nebulosus* Cdz. Ceylon [Cand.]; *Lacon nebulosus* Cdze. (ex coll. Cand.) [Janson] (BMNH).

Paralectotype. CEYLON: ♂, Ceylon; Janson coll. 1903.130; *Lacon nebulosus* (ex coll. Cand.) [Janson] (BMNH).

The published locality is 'les regions orientales et boreales de l'Inde'. I have not found any specimens bearing these localities. Candèze (1874 : 84) records the locality as 'Hindoustan; Ceylon' which in my opinion justifies the lectotype designation.

The BMNH possesses a male from Rangoon with Candèze label 'nebulosus affinis'. This is probably the specimen tentatively attributed to the species by Candèze (1874). It is not conspecific with the lectotype. Candèze (1892c : 485) records this species as being 'rare' in Chota Nagpore. I have not seen any specimens from this locality.

Other material examined. INDIA: South Shan States, road 40 m East of Taunggyi, 25.ix-13.x.34, 1 ♀; Tenasserim, Mekane, 90 km East of Moulmein, 200 m, 2-8.xi.34, 1 ♀ (NR, Stockholm), 1 ♀ (MNHN, Paris). Fleutiaux, 1942, localities.

***Adelocera niger* (Schwarz) comb. n.**

*Pericus niger* Schwarz, 1902f : 307.

LECTOTYPE (present designation). BURMA: ♂, Rangoon; Coll. Schwarz; co-typus, *niger* Schwarz [Schwarz]; genus *Brachylacon*, Fleutiaux det., 5.33. [Fleut.] (DEI, Eberswalde).

Paralectotype. BURMA: 1 ♂, Rangoon; Coll. Schwarz, co-typus (DEI, Eberswalde).

Schwarz's series usually include a specimen bearing a type-label, but I have not found a specimen of this species marked in this way. By analogy with specimens of similar appearance such as *nitidus* Candèze it seems probable that when a series including both sexes becomes available *niger* Schwarz will be found to be the male of *turgescens* Candèze.

***Adelocera nitidus* (Candèze) comb. n.**

*Pericus nitidus* Candèze, 1857 : 167; pl. 2, fig. 20.

*Pericus sanguinolentus* Candèze, 1893c : 172. **Syn. n.**

*Pericus nitidus* Candèze. LECTOTYPE (present designation). [NORTH INDIA]: ♀, N. India [Janson]; Ind. bor.; Janson Coll. 1903.130; *Pericus nitidus* Cdze, type, ex. coll. de Laferté [Janson]; *Pericus nitidus* [Cand., stuck on underside of Janson's label] (BMNH).

The description was based on two specimens from 'des parties septentrionales des Indes Orientales' (see p. 271), one in the de la Ferté and the other in the Deyrolle collection. The paralectotype has not been located. I have been unable to find any specimens with labels corresponding to the published type-locality. The discrepancy between the published locality and that on the label is probably due to Janson (see p. 276).

*Pericus sanguinolentus* Candèze. Holotype. INDIA: ♂, Belgaum S., *sanguinolentus* Cand., n.sp. 1893, Bombay, And. [Cand.]; Type: Collection Candèze (IRSNB, Brussels). The published type locality and date is Belgaum, Sampgaon, Avril.

The synonymy is based on the examination of a series in the BMNH from Chipurupali [Chipurupalle, 17°34'N., 33°10'E.], comprising both males and females. The species displays marked sexual dimorphism. The female is larger than the

male with the prothorax and elytra shining and without punctures. The prothorax and elytra of the male are moderately strongly and closely punctured.

***Adelocera oberndorferi* (Schwarz) comb. n.**

*Pericus oberndorferi* Schwarz, 1902b : 202.

LECTOTYPE (present designation). INDIA: ♂, Madras; Coll. Schwarz; Type; oberndorferi Schw. [Schwarz]; *Pericus nitidus* Cand., Fleut. det. 5.1933; kann nicht nitidus sein dessen Flgd. 'lisses et sans stries' sind, Muller det. 1940 (DEI, Eberswalde).

As far as I am aware Fleutiaux did not publish the *nitidus-oberndorferi* synonymy.

Other material examined. INDIA: Madras, xi. 1907, 1 ♂ (BMNH).

***Adelocera obesus* (Candèze)**

*Lacon obesus* Candèze, 1857 : 132; pl. 2, fig. 18.

*Adelocera obesus* (Candèze) Fleutiaux, 1926 : 16.

LECTOTYPE (present designation). CEYLON: ♀, Ceylon, *Lacon obesus* Cdze. Ceylon [Cand.]; Janson Coll. ex. Candèze, 1903.130; *Lacon obesus* Cand., Ceylon ex. coll. Candèze [Gahan] (BMNH).

Paralectotypes. CEYLON: 1 ♀, Ceylon;.....S; 6; diamond shaped blue label; Mus. Zool. Polonicum Warszawa 12/45. WARSAW 1 ♂, Ceylon.....S; 99; *obesus* Cand. Ceylon Nr. [unknown mss.]; Mus. Zool. Polonicum Warszawa 12/45 (IZPAN, Warsaw).

Candèze based his description on material 'communiquée par M. Dohrn'. There is no means of discovering whether Candèze retained the material or whether he returned some or all of it. For the history of the Dohrn collection see p. 274. Since neither of the IZPAN, Warsaw specimens bear Candèze's determination label, I have selected the specimen in the BMNH which is known to be from the Candèze collection as the lectotype.

Other material examined: CEYLON: Horawupotana 16.x.24, 2 ♀; Woodside, Urugalla, 9.iv.23, 1 ♀ (BMNH).

***Adelocera oblongus* (Fleutiaux) comb. n.**

*Brachylacon oblongus* Fleutiaux, 1934e : 365.

LECTOTYPE (present designation). PHILIPPINES: ♀, Manilla, v.19. P.I.; *Brachylacon oblongus* Fleut; type [Fleut.]; *Brachylacon microcephalus* Motsch. [?Fleut.] (MNHN, Paris).

***Adelocera paeninsularis* (Fleutiaux) comb. n.**

*Trachylacon paeninsularis* Fleutiaux 1935a : 15.

Holotype. MALAYA: ♂, Singapore, Baker; *Trachylacon paeninsularis* Fleut., type [Fleut.] (MNHN, Paris).

Fleutiaux remarked that this is the only species in which the humeral callosity is carinate. However, he was mistaken: a similar carina occurs in *Adelocera microcephalus* Motschulsky.

*Adelocera parvus* (Boheman)

*Lacon parvus* Boheman, 1851 : 416.

*Lacon occidentalis* Candèze, 1857 : 130. **Syn. n.**

*Lacon occidentalis* Candèze; Gerstaecker, 1871 : 54.

*Lacon occidentalis* Candèze; Gerstaecker, 1873 : 174.

*Lacon signatus* Candèze, 1882 : 6. [Synonymized by Fleutiaux, 1919 : 16.]

*Lacon occidentalis* Candèze; Fleutiaux, 1921 : 6.

*Lacon occidentalis* Candèze; Fleutiaux, 1922 : 589.

*Adelocera occidentalis* (Candèze) Fleutiaux, 1927 : 96.

*Adelocera parvus* (Boheman) Fleutiaux, 1926 : 99.

*Adelocera occidentalis* (Candèze); Fleutiaux, 1935b : 198.

*Lacon parvus* Boheman. **LECTOTYPE** (present designation). SOUTH AFRICA: Caffraria; J. Wahlb., Type: *parvus* Bhm. [Boh.] (NR, Stockholm). The abdomen is missing.

The published locality is 'Habitat in regione fluvii Limpopoensis'. Boheman's localities are discussed on p. 280. The specimen measures 5.5 mm in length and 2 mm in width compared with Boheman's measurements of 5 mm and 1½ mm.

Candèze (1857 : 161 as *charcus*, corrected 1874 : 59) comments that he did not find this species among the specimens he received from Stockholm. It would appear that the species remained unknown to Candèze, as in 1874 : 45 it is listed as *sp. incertae sedis* at the end of the key.

*Lacon occidentalis* Candèze. **LECTOTYPE** (present designation). SENEGAL: ♀, Senegal; *occidentalis* [Cand.]; Collection Chevrolat; *occidentalis* Cand., type Mon. p. 130 [Fleut.]; Fleut. Voy. All. et Jeann. Afr. Or. Elat. p. [Fleut.]. The specimen stands over a blue Chevrolat collection label 'Lacon occidentalis Cand. Mon. 1, 130, 48 Senegalia' (MNHN, Paris).

Paralectotypes. SENEGAL: 1 ♀, Laf. Senegal; *occidentalis* Cdz. [Cdz.]: Lacon occidentalis Cdz. Type, e. coll. de Laferté [Janson] (BMNH). 2 ♀, Laf. Senegal; Janson Coll., 1903 : 130; Lacon occidentalis Cdz. Cand. e. coll. de Laferté [Janson] (BMNH).

*Lacon signatus* Candèze. **LECTOTYPE** (present designation). TANZANIA: ♀, Zanguebar, Mhonda [in manuscript, next word illegible, probably Ouzigoua, see below] A. Hacquard, Miss. Ap. 1879 — 1<sup>ère</sup> trim. 1880; L. signatus [Cand.]; Museum Paris 1952, Coll. R. Oberthur (MNHN, Paris).

Paralectotypes. ♀, without labels standing beside lectotype. TANZANIA: 2 ♀, Zanguebar, Mhonda, Ouzigoua. A. Hacquard Mis. ap. 1879 1<sup>er</sup> trim. 1880; [printed label], Museum Paris 1952, coll. R. Oberthur. One specimen bears a determination label: Lacon signatus Cdz. [Cand.] teste Candèze (MNHN, Paris). The two specimens with printed labels were not standing with the lectotype when they were discovered in the Oberthur collection, but there can be no doubt that they are part of the original series.

The description is based on an unrecorded number of specimens from Zanguebar. This name was formerly applied to a strip of the East African coast between the mouth of the Juba (or Giuba) River ( $1^{\circ}00'S.$ ,  $42^{\circ}05'E.$ ) and Cape Delgado ( $10^{\circ}45'S.$ ,  $40^{\circ}38'E.$ ). Mhonda ( $6^{\circ}07'S.$ ,  $37^{\circ}36'E.$ ) lies about 60 miles from the coast. Candèze does not record the provenance of his material so it would be reasonable to assume that it was in his own collection now in the IRSNB, Brussels (see p. 271). However, there are no specimens from the type locality determined by Candèze in that institution. It seems probable that the specimens formed part of a collection, made by Hacquard at Mhonda and exhibited by Oberthur in 1880 (*Bull. Soc. ent. Fr.* (5) **10** : CXVIII). Oberthur (loc. cit. : CXIX) states that the Elateridae had been studied by Candèze and included some new species.

Candèze refers to Gerstaecker (*Acad. Berlin Bull.* 1866 : 54) [ $? = Mber. K. preuss. Akad. Wiss. Berlin$ ] commenting that this is the species considered by Gerstaecker to be *L. occidentalis*. To the best of my belief Gerstaecker did not publish any comments on *L. occidentalis* in 1866. In 1871 he recorded *occidentalis* from Lake Jipe [Kenya] and in 1873 repeated the record, remarking that the species was previously known from Senegal. The origin of Candèze's reference is unknown to me.

Other material examined. SENEGAL: Galam [district, capital Bakel], 1 ♂; Dakar, 2 ♂, 5 ♀ (Fleutiaux, 1919, localities) (MNHN, Paris); Bambey, 3 ex (BMNH); Sebikotane [ $14^{\circ}45'N.$ ,  $17^{\circ}08'E.$ ], vii, 2 ex. (BMNH). MALI: Khayes [=Kayes,  $14^{\circ}26'N.$ ,  $11^{\circ}28'E.$ ], 1 ♂, 2 ♀ (Fleutiaux, 1919, locality) (MNHN, Paris). GUINEA: Reg. de Kouroussa, 3 ♀ (MNHN, Paris). IVORY COAST: Bassam, 1 ♀ (MNHN, Paris). DAHOMEY: near Porto Novo, 2 ♂ (MNHN, Paris). NIGERIA: S.E. Kano, Azare, 3 ex. (BMNH). CHAD: Fort Achambault, Ba-Karé (Boungoul) Kien-Kaga ou Kiemboga, 1 ♀ (MNHN, Paris). SUDAN: Delami, v 1 ♂ (MNHN, Paris); Juba, 2 ♂ (ZMU, Helsinki). ETHIOPIA: Bourie (believed to be misprint for Bourillé on R. Omo, 60 m. N. of L. Rudolf, Fleutiaux, 1935b, locality), 2 ♂, 4 ♀ (MNHN, Paris); 1 ♂, 1 ♀ (BMNH); Hargeisia, vi, 3 ♂ (ZMU, Helsinki). UGANDA: Mt Kadan, Karamoja, iv, 2 ♂, 1 ♀ (BMNH). KENYA: Lamu I., iv, v, 1916, 1 ♀ (MNHN, Paris); Mombassa, 3 ♀ (Fleutiaux, 1919, locality) (MNHN, Paris); Mont Loroghi, 1 ♂ (Fleutiaux, 1922, locality) (MNHN, Paris); Turkana Desert, Lokitang [sic], 1 ♂ (Fleutiaux, 1935b, locality) (MNHN, Paris); Pays Taita: Bura, iii, 1912, 1 ♀ (Fleutiaux, 1919, locality) (MNHN, Paris); Lac Jipe (*v. d. Decken*), 3 ♂, 1 ♀ (Gerstaecker, 1871 and 1873, locality) (MNHU, Berlin). TANZANIA: Zanguebar, 1 ♂ (Fleutiaux, 1919, locality) (MNHN, Paris); Zanzibar, 1 ♂ (MNHN, Paris); Bagamoyo, 1 ♂ (IRSNB, Brussels); Tanga, 1 ♀ (DEI, Eberswalde). MOZAMBIQUE: Zambeze, Caia, ix, 2 ex. (BMNH); Nova Choupanga, near Chemba, vi, 1 ♀, viii, 1 ♂, xii, 1 ♀ (MNHN, Paris); Pungoué [Pungué] Valley, ii, 3 ♀, iv, 3 ♀, vi, 1 ♀, xi, ♀, xii, 1 ♀ (MNHN, Paris); Barne 15 m. E. of Canxixe, i, 1 ♀ (MNHN, Paris); Chiramba, i, 1 ♀, ii, 1 ♂, 1 ♀ (MNHN, Paris); Tambara, ii, 1 ♀. SOUTH AFRICA: Zoutpan. [ $? = Soutpansberg$ ] xi, 1 ♀ (MNHN, Paris).

I have not been able to trace the specimens recorded from Bogos, Abyssinia by Candèze (1874) and Transvaal by Fleutiaux (1935b).

***Adelocera perraudieri* (Fleutiaux) comb. n.**

*Brachylacon perraudieri* Fleutiaux, 1927 : 90.

[*Lacon nebulosus* Candèze; Fleutiaux, 1889 : 139. Misidentification.]

[*Lacon nebulosus* Candèze; Fleutiaux, 1895 : 685. Misidentification.]

*Brachylacon perraudieri* Fleutiaux; Fleutiaux, 1947 : 252.

LECTOTYPE (present designation). CAMBODIA: ♀, PP [for Pnomh Penh].  
*Brachylacon perraudieri* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes: 1 ex., PP; *L. nebulosus* Cand., Pnomh Penh, Camboge, 1889 [Fleut.]. 1 ♀, PP, 1 ♂, Cap St Jaques (MNHN, Paris).

***Adelocera planus* (Fleutiaux) comb. n.**

*Hemicleus planus* Fleutiaux, 1919 : 13.

LECTOTYPE (present designation). KENYA: ♀, Afrique Orient. Angl. Kisoumou (Victoria Nyanza) Ch. Alluaud; Sept.; *Hemicleus planus* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. KENYA: ♀, Afrique Orient. Angl. Nakuro (Rift Valley) Ch. Alluaud; Dec.; voir art. ant 2 + 3 [Fleut.]; *Hemicleus planus* Fleut., Co-type [Fleut.] (MNHN, Paris).

***Adelocera pygmaeus* (Baudi)**

*Lacon pygmaeus* Baudi, 1871 : 49.

*Lacon pygmaeus* Baudi; Marseul, 1872 : 343.

*Adelocera pygmaeus* (Baudi) Fleutiaux, 1926 : 97.

Holotype. ♀, without labels (IMZU, Turin).

The published locality is CYPRUS.

Other material examined. TURKEY: Adana, 2 ♂ (MNHN, Paris); Namrun, vi, 1 ♀ (Wewalka collection, Vienna). LEBANON: Beyrouth, 1 ♀ (MNHN, Paris).

***Adelocera quadriguttatus* (Candèze)**

*Lacon quadriguttatus* Candèze, 1895c : 485.

*Adelocera quadriguttatus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. SUMATRA: sex undetermined, Pangherang Pisang, collected by Modigliani between Nov. 1890 and March 1891 (MCSN, Genoa).

I have not had the opportunity of examining this specimen. The generic attribution is based on Candèze's statement that the species closely resembles *L. nebulosus* Candèze.

***Adelocera rubicundus* (Candèze) comb. n.**

*Pericus rubicundus* Candèze, 1874 : 107.

Holotype. Sex undetermined, N; Janson Coll. 1903 : 130; *Pericus rubicundus*

Cdz., type [Cand.]; *Pericus rubicundus* Cdze. type [Janson] (BMNH). The genitalia are missing.

The species was described from an unknown locality. Up to the present time no additional specimens of this species are known to me.

***Adelocera santali* (Fleutiaux) comb. n.**

*Trachylacon santali* Fleutiaux, 1933 : 5.

*Trachylacon santali* Fleutiaux; Fleutiaux, 1935a : 17.

Lectotype (designated by Fleutiaux, 1935a). INDIA: ♂, 1.ix.30, Aiyur, N. Salem, F.R.I. Sandal Survey; Plot 18; *Trachylacon santali* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. Two examples from the type-locality, v.30, plot 18 and xi.30, plot 19 should be in the collections of the FRI, Dehra Dun. I have not had the opportunity of examining these specimens.

***Adelocera schonfeldti* (Candèze) comb. n.**

*Agraeus schonfeldti* Candèze, 1893b : 11.

*Agraeus schonfeldti* Candèze; Fleutiaux, 1935a : 24.

*Agraeus candezei* Fleutiaux, 1935a : 24. **Syn. n.**

*Agraeus schonfeldti* Candèze. LECTOTYPE (present designation). BORNEO: ♀, Borneo; n. sp. iv. 1891, *schonfeldti* Cand. Borneo; Sch. [Candèze, yellow border]; Collection E. Candèze: *Agraeus schonfeldti* Cand. det. E. Candèze [IRSNB curatorial label]; *schonfeldti* Cand. ♂, 1934 [Fleut.] (IRSNB, Brussels).

Candèze had specimens of both sexes, but mis-identified them. He believed that the prothorax of the male possessed a large median tubercle, while that of the female had no tubercle. Fleutiaux (1935a) records that the type is in the IRSNB, Brussels, but does not mention any other specimens. He comments that by analogy with other [related] species, Candèze mis-identified the sexes and that the type is probably a female. Dissection of the lectotype, which agrees with the description of the male, has shown this to be so. Candèze's 'female' specimens cannot be found in the IRSNB, Brussels.

*Agraeus candezei* Fleutiaux. LECTOTYPE (present designation). BORNEO: ♂, Riam Kanan, Martapoera, Z. O. Borneo, Doherty, VI-VII; *Candezei* Fleut. type; ? *schonfeldti* Cand., ♀ [Fleut.] (MNHN, Paris).

Paralectotypes. JAVA: 1 ♂, Java (Meuwen Bay), Detr. de la Sonde, Raffray & Maindron 1878; *Agraeus candezei* Fleut., *schonfeldti* ♀ Cand. [Fleut.] (MNHN, Paris). BORNEO: 2 ♀, Kuching. J. E. A. Lewis, 1919 : 16; one specimen bears two labels: near *feroculus* det. K. G. Blair [Blair]; *Candezei* Fleut. ? *schonfeldti* Cand., ♀ (MNHN, Paris). SUMATRA: 1 ♂, Sumatra, coll. Schwarz; Mouhoti Cand. [Schwarz]; ? *feroculus* Cand., ? *schonfeldti* Cand. ♀ (non ♀, sed ♂) 8.33 [Fleut.] (DEI, Eberswalde). MALAYA: 1 ♂, Singapore; *cuniculus* Cand., Singapore Fl. [Cand.]; Collection Candèze; *Agraeus cuniculus* Cd. det. Candèze [IRSNB curatorial

label]; *candezei* Fleut., *schonfeldti* Cand., ♀ Fleut. rev. 1934 [Fleut.] (IRSNB, Brussels). This is obviously the specimen to which Fleutiaux (1935a : 24) refers in his footnote, though it bears no label to show that it came from the Raffray collection.

***Adelocera serricornis* (Quedenfeldt)**

*Lacon serricornis* Quedenfeldt, 1886 : 23, pl. 1, figs 13, 13a.

*Adelocera serricornis* (Quedenfeldt) Fleutiaux, 1925 : 205.

LECTOTYPE (present designation). ♂, *Lacon serricornis* Qdft. Qgo. [? Quedenfeldt]; Ex Museo Quedenfeldt; Paris Museum, 1952, R. Oberthur Coll. (MNHN, Paris).

Quedenfeldt does not record a precise type-locality. The species was described from an unrecorded number of specimens collected by Major von Mechow between 1878 and 1881 in the course of expedition to Angola and the Quango River. According to Horn (1936 : 170), part of von Mechow's collection passed via Quedenfeldt to the NMHU, Berlin and the remainder to Oberthur (now in the MNHN, Paris). There are no specimens in the NMHU, Berlin.

Quedenfeldt's figure is misleading. The third antennal segment, though triangular, is not as large as the fourth.

***Adelocera shirozui* (Ohira) comb. n.**

*Brachylacon (Aganolacon) shirozui* Ohira, 1967a : 55.

*Brachylacon (Aganolacon) shirozui* subsp. *ishigakiensis* Ohira, 1967b : 105.

*Brachylacon (Aganolacon) shirozui* Ohira. Holotype. TAIWAN: ♂, Formosa, Nanzan-kei [sic, published locality Nanshanchi] 1965-iv.26, T. Shirozui; *Brachylacon (Aganolacon) shirozui* Ohira 1967 [Ohira] (Ohira Coll.).

The author believed the type to be a female. Dissection has shown it to be a male.

*Brachylacon (Aganolacon) shirozui* subsp. *ishigakiensis*. Holotype. JAPAN: ♀, Ishigaki (Omotodake) 27.vii.1964, H. Koshi (Shibata coll., Osaka. Ohira, in litt., specimen not examined).

***Adelocera sparsus* (Candèze)**

*Lacon sparsus* Candèze, 1874 : 85.

*Adelocera sparsus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). JAVA: ♀, Java, C.W.; Janson coll. 1903.130; *sparsus* Cdz., type [Cand.]; *Lacon sparsus* Cand., type, Java [Janson] (BMNH).

The specimen recorded from Thagata, Tenasserim (♂, MCSN, Genoa) by Candèze (1888 : 671) is not conspecific with the lectotype and belongs to a species unknown to me. I have not had the opportunity of examining the specimens from Coorg; Frazerpet and Jawalagiri (? FRI, Dehra Dun) recorded by Fleutiaux (1933 : 5).

***Adelocera subcostatus* (Candèze)**

*Lacon subcostatus* Candèze, 1891a : 774.

*Adelocera subcostatus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. BURMA: Carin Cheba (see p. 275), collected in March, 1888 by Fea. MCSN, Genoa.

The generic attribution is tentative, based on Candèze's comment that this species belongs to the same 'section' as *trifasciatus* Candèze.

***Adelocera succinatus* (Candèze)**

*Lacon succinatus* Candèze, 1890 : cl.

*Lacon succinatus* Candèze; Candèze, 1892c : 485.

*Adelocera succinatus* (Candèze) Fleutiaux, 1926 : 207.

LECTOTYPE (present designation). INDIA: ♀, Bengale; *succinatus* Cdz. Bengal. P. Card. [Candèze, yellow border]; *Lacon succinatus* Cd., det E. Candèze [IRSNB curatorial label]; Collection E. Candèze (IRSNB, Brussels).

Paralectotypes. INDIA: 1 ex., Bengale; *Lacon succinatus* Cd. det. E. Candèze [IRSNB curatorial label]; Collection E. Candèze (IRSNB, Brussels). 1 ex., Chota Nagpur, Bengale; *succinatus* Cand. det. [Cand.]; Cand., C.R. Soc. Ent. Belge 1890, Ann. soc. Ent. Belg 1892 [Fleut.] (MNHN, Paris).

The published type-locality is Chota Nagpur (see p. 273). Experience has shown that specimens from this locality may bear only 'Bengale' labels. The lectotype agrees well with the description, although it measures 10 mm compared with the published length of 9 mm. Despite the absence of detailed locality labels, I have no doubt that these specimens formed part of Candèze's original series.

***Adelocera tabaci* (Fleutiaux)**

*Lacon tabaci* Fleutiaux, 1895b : 167.

*Adelocera tabaci* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). SUMATRA: ♂, Sumatra; *Lacon tabaci* Fleut., type [Fleut.]; *L. tabaci* Fleut., type, Ann. Belge, 1895 : 167 [Fleut.] (MNHN, Paris).

***Adelocera tanganus* nom. n.**

*Hemicleus minutus* Schwarz, 1903a : 358.

*Lacon minutus* (Schwarz) Fleutiaux, 1919 : 20.

*Adelocera minutus* (Schwarz) Fleutiaux, 1926 : 96. [Junior secondary homonym of *Adelocera minutus* (Candèze, 1878a : LII).]

LECTOTYPE (present designation). TANZANIA: ♀, Tanga; *minutus* Schw. [Schwarz]; Coll. Schwarz; Typus (DEI, Eberswalde). The specimen has suffered considerable damage. The head and right-hand portion of the pronotum are missing.

Other material examined. KENYA: Voi, 4 ex. (MNHN, Paris), 1 ♀ (DEI,

Eberswalde); Sambourou (Wa-Nyika), 1 ex. TANZANIA: Zanguebar, 1 ex.; Kilimanjaro, versant sud-est, Rivière Himo, 1 ex. (Fleutiaux, 1919, localities) (MNHN, Paris).

***Adelocera testaceus* (Fleutiaux) comb. n.**

*Brachylacon testaceus* Fleutiaux, 1935c : 92.

LECTOTYPE (present designation). KENYA: ♂, MacArthur, Ziwani, Apr. 1933; Musée de Nairobi; *Brachylacon testaceus* Fleut. [Fleut.] (NM, Nairobi).

Paralectotype. 1 ex., same locality-label as lectotype; *Brachylacon testaceus* Fleut., type [Fleut.] (MNHN, Paris). The specimen is very badly damaged. A great part of the prothorax, the elytra and the entire abdomen are missing. It is for this reason that I have not followed my usual practice of designating the specimen marked 'Type' by Fleutiaux as the lectotype.

The location of Ziwani is probably 3°23'S, 37°48'E in Kenya and not a place of the same name at 10°22'S, 40°15'E in Tanzania.

The material recorded from Thua River, xi (*MacArthur*) has not been located. See also note on this locality under *Lanelater acuminatus* (Fleutiaux) p. 242.

The female from Ennendi, Chad, identified as *Brachylacon aethiopicus* by Cobos (1964 : 586), may belong to this species.

***Adelocera tripartitus* (Fleutiaux) comb. n.**

*Agraeus tripartitus* Fleutiaux, 1927 : 98; pl. 2, fig. 36.

*Agraeus tripartitus* Fleutiaux; Fleutiaux, 1935a : 23.

*Agraeus tripartitus* Fleutiaux; Fleutiaux, 1947 : 29.

LECTOTYPE (present designation). NORTH VIETNAM: ♂, Tonkin, Lac Tho, Hoa Binh, A. de Cooman; *Agraeus tripartitus* Fleut., type [Fleut.]; type de la figure [Fleut.] (MNHN, Paris).

Paralectotypes: 4 ♂, same locality as the type. Two specimens bear Fleutiaux's determination label and another Fleutiaux's labels 'dessiné par Lesne 1932' and 'pieces genitales [which are missing] gardés par Lesne' (MNHN, Paris).

Other material examined. NORTH VIETNAM: 1 ex. Rakam (Fleutiaux, 1947, locality) (MNHN, Paris). LAOS: 1 ♂, Xieng Khouang, iv (BMNH).

***Adelocera tumens* (Candèze)**

*Lacon tumens* Candèze, 1873 : 4.

*Adelocera tumens* (Candèze) Fleutiaux, 1926 : 96.

Holotype. JAPAN: ♂, *Lacon tumens* n. sp. Cdze. [? Lewis]; Japan, G. Lewis, 1910.320 (BMNH). It would appear that Lewis relabelled the specimen on which Candèze based his description.

I have not had the opportunity of examining the specimens recorded from FORMOSA by Miwa (1929 : 232 and 1934 : 70).

***Adelocera tumidipennis* (Candèze)**

*Lacon tumidipennis* Candèze, 1878b : LIV (7).

*Lacon pusillus* Schwarz, 1898 : 186. [Synonymized by Fleutiaux, 1919 : 20.]

*Adelocera tumidipennis* (Candèze) Fleutiaux, 1926 : 96.

*Lacon tumidipennis* Candèze. Lectotype (designated by Fleutiaux, 1919 : 20). TANZANIA: Zanzibar, Raffray (MCSN, Genoa). Not examined.

Paralectotypes. TANZANIA: 1 ♀, Zanzibar, Raffray; Museum Paris 1952, Coll. R. Oberthur; 251; *Lacon tumidipennis* Cdz. [Cand.]. 1 ♀, locality and collection as above, 252 (MNHN, Paris).

Candèze did not record how many specimens he examined. Fleutiaux (1919) states that the unique type is in the MCSN, Genoa. However since it is known (see p. 275) that Fea's duplicate material was acquired by other collectors, I believe that the inclusion of the MNHN, Paris material in the type-series is fully justified.

*Lacon pusillus* Schwarz. LECTOTYPE (present designation). TANZANIA: ♂, Usamb., Coll. Schwarz; Typus; *pusillus* Schw. [Schwarz] (DEI, Eberswalde).

Paralectotypes. TANZANIA: 2 ♀, 1 ♂ originally on the same pin as the type, 2 ♀, Usamb.; Coll. Schwarz; Typus. 1 ♀, Usambara; Coll. Schwarz; Typus. 1 ♀, Usamb. Weise; Coll. Schwarz; Typus (DEI, Eberswalde).

***Adelocera turgescens* (Candèze) comb. rev.**

*Lacon turgescens* Candèze, 1874 : 84.

*Lacon turgescens* Candèze; Fleutiaux, 1918a : 195.

*Adelocera turgescens* (Candèze) Fleutiaux, 1926 : 96.

*Brachylacon turgescens* (Candèze) Fleutiaux, 1927 : 93, pl. 2, fig. 25.

*Brachylacon turgescens* (Candèze) Fleutiaux, 1947 : 253.

LECTOTYPE (present designation). MALAYA: ♀, Penang [Janson]; Janson Coll. 1903.130; *L. turgescens* Cdz. type [Cand.] (BMNH).

The published locality, Paulo Penang, is an alternative spelling for Penang.

Other material examined. NORTH VIETNAM: Keng-Kabao, 1 ex. (Fleutiaux, 1927, locality) (MNHN, Paris). Savanakheth, vii, 1 ex. (Fleutiaux, 1918a, locality) (MNHN, Paris). CAMBODIA: Kompong Thon, 1 ♂, 1 ex. (Fleutiaux, 1918a, locality) (MNHN, Paris).

***Adelocera variegatus* (Schwarz) sp. rev., comb. n.**

*Pericus variegatus* Schwarz, 1902b : 203.

*Pericus variegatus* Schwarz, 1906 : 28; pl. 1, fig. 11.

*Trachylacon fulvicollis* var. *variegatus* (Schwarz) Fleutiaux, 1932e : 79.

*Trachylacon fulvicollis* var. *variegatus* (Schwarz); Fleutiaux, 1935a : 13.

LECTOTYPE (present designation). BURMA: ♀, Birma; Coll. Schwarz; Typus; *variegatus* Schw. [Schwarz]. *Trachylacon fulvicollis* var. *Fleut. det. 5.33* [Fleut. (DEI, Eberswalde)].

Other material examined. NORTH VIETNAM: 1, Tonkin, Lac Tho, Hoa Binh,

A. de Cooman; *Pericus variegatus* Schw., comparé au type [Fleut.]; *Brachylacon fulvicollis* Motsch., type elytres [next word illegible] au sommet [Fleut.] (Fleutiaux, 1935a, locality) (MNHN, Paris).

### *Adelocera weisei* (Schwarz)

*Lacon weisei* Schwarz, 1898b : 185.

*Lacon weisei* Schwarz; Schwarz, 1908 : 75.

*Lacon weisei* Schwarz; Fleutiaux, 1919 : 20.

*Adelocera weisei* (Schwarz) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). TANZANIA: ♀, Usamb. Weise; Coll. Schwarz; Typus; *weisei* Schw. [Schwarz] (DEI, Eberswalde).

Paralectotype. TANZANIA: 1 ♀, locality label as lectotype, but without Schwarz's determination label (DEI, Eberswalde).

Other material examined. TANZANIA: Kilimandjaro, Kibonoto, iv, 1 ex. (MNHN, Paris); Kilimandjaro (Schwarz, 1908, locality) 1 ♂, 1 ♀ (DEI, Eberswalde). KENYA: Taveta, iii, 1 ♂ (Fleutiaux, 1919, locality) (MNHN, Paris).

### *SCAPHODERUS* Candèze

*Scaphoderus* Candèze, 1857 : 46. Type-species: *Scaphoderus riehlII* Candèze, by monotypy.

*Bruyantius* Fleutiaux, 1925a : 101. Type-species: *Bruyantius capensis* Fleutiaux, by monotypy.

#### Syn. n.

GENERIC DIAGNOSIS. Each claw bearing a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum does not form part of the margin of the mesocoxal cavity; mesepimeron forms part of margin of the mesocoxal cavity (Text-fig. 3). Second and third antennal segments subequal, each smaller than the fourth and following segments (Text-fig. 13). Antennal groove occupying the anterior three-quarters of the prosternopleural suture and deep enough to accommodate the antennae. Body clothed with scales. Lateral margin of pronotum explanate, lateral carina present but not attaining the anterior margin. A band of longer, more closely packed, erect setae present on the lateral margins of the pronotum. Propleurae and metasternum without grooves or depressions for the accommodation of the anterior and middle tarsae. Scutellum simple, without carina. Tarsi simple, without ventral lobes.

HISTORY OF THE GENUS. The genus was erected for a single species which differed from *Adelocera* (sensu auct., nec Latreille, 1829 = *Lacon* Castelnau of the present work) in that the second and third antennal segments are short and from *Lacon* (sensu auct., nec Castelnau, 1836 = *Agrypnus* Eschscholtz of the present work) in that the antennal groove is longer.

NOTES ON THE GENERIC SYNONYMY. Only the paired tubercles on the anterior margin of the pronotum and the more strongly explanate margins of the prothorax distinguish *Scaphoderus* (♀ only known) from *Bruyantius* (♂ only known). Since the males and females of certain species (e.g. *mannerheimii* (Candèze)) belonging to the closely related genus *Adelocera* differ from one another in the same way it seems reasonable to assume that the differences which have been used to separate the genera are no more than secondary sexual characteristics.

DISTRIBUTION. South Africa.

BIOLOGY AND HABITS. Reichensperger (1915: 19) states that *riehlii* Candèze may be myrmecophilous. Otherwise nothing is known of the life-history and habits of the two species included in the genus.

#### SPECIES INCLUDED IN THE GENUS

Two species are assigned to the genus. It is debatable whether the presence of a band of closely packed setae on the lateral margin of the pronotum is of sufficient importance at the generic level to justify the retention of *Scaphoderus* as a separate genus. When additional material becomes available it may become apparent that these two species should be included in *Adelocera*.

#### *Scaphoderus capensis* (Fleutiaux) **comb. n.**

*Bruyantius capensis* Fleutiaux, 1925 : 101.

LECTOTYPE (present designation). SOUTH AFRICA: ♂, Museum Paris, Colonie du Cap. Steynsburg. R. Ellenberger 1914; *Bruyantius capensis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. SOUTH AFRICA: ♂, same locality label as lectotype, but without a determination label (MNHN, Paris).

#### *Scaphoderus riehlii* Candèze

*Scaphoderus riehlii* Candèze, 1857 : 46; pl. 1, fig. 3.

Holotype. SOUTH AFRICA: ♀, Buq. Natal; Janson coll. 1903.130; *Scaphoderus riehlii* Cdz. [Cand.]; *Cardiophorus singularis* Buq. [Buquet]; *Scaphoderus riehlii* Cdz., type (e coll. de Laferté) (*Cardiophorus* ? *singularis* Buq. in mus.) [Janson] (BMNH).

#### LACON Castelnau

[*Adelocera* sensu auct., nec Latreille, 1829. Misinterpretation.]

*Lepidotus* Stephens, 1830 : 374. Type-species: *Elater varius* Olivier, 1790 [= *Lacon quercea* (Herbst, 1874)], by subsequent designation (Hyslop, 1921 : 652). [Homonym of *Lepidotus* Asso, 1801 : 38 (Pisces), replaced by *Zalepia* Arnett, 1953.]

*Lacon* Castelnau, 1836 : 11. Type-species: *Elater atomarius* Fabricius, 1789 [= *Lacon punctatus* (Herbst, 1779)], by subsequent designation (Hyslop, 1921 : 652).

*Ocneus* Candèze, 1857 : 87. Type-species: *Ocneus limbatus* Candèze, by monotypy. **Syn. n.**

*Scelisus* Candèze, 1863 : 327. Type-species: *Scelisus sanguineus* Candèze, by monotypy. **Syn. n.**

*Alaotypus* Schwarz, 1902 : 307. Type-species: *Alaotypus subpectinatus* Schwarz, by subsequent designation (Hyslop, 1921 : 625). [Synonymized with *Adelocera* sensu auct., by Fleutiaux, 1918d : 183.]

*Sulcilacon* Fleutiaux, 1927 : 65. Type-species: *Adelocera geographica* Candèze, by original designation. **Syn. n.**

*Diphyaulon* Arnett, 1952 : 112 [as a subgenus of *Lepidotus* Stephens]. Type-species: *Adelocera pyrsolepis* LeConte, by original designation. [Raised to generic status, Arnett, 1969 : 11.]

**Syn. n.**

*Aulacon* Arnett, 1952 : 112 [as a subgenus of *Lepidotus* Stephens]. Type-species: *Adelocera nobilis* Fall, by original designation. [Raised to generic status, Arnett, 1969 : 11.] **Syn. n.**

*Zalepia* Arnett, 1953 : 7. [Replacement name for *Lepidotus* Stephens; as a subgenus of *Lacon* Castelnau. Raised to generic status, Arnett, 1969 : 11.] **Syn. n.**

*Koblacon* Chujo & Ohira, 1965 : 2 [as a subgenus of *Lacon* Castelnau]. Type-species: *Lacon quadrinodatus* Lewis, by monotypy. **Syn. n.**

*Lepidelater* Smith, 1969 : 11. Type-species: *Lepidelater misticius* Mignot, by monotypy. **Syn. n.**

*Arnettia* Golbach, 1969 : 155. Type-species: *Adelocera aberrans* Candèze, by monotypy. **Syn. n.**

*Monocyrtion* Golbach, 1969 : 156 [as a subgenus of *Lacon*]. Type-species: *Adelocera chabannei* Guérin, by original designation. **Syn. n.**

*Cornilacon* Golbach, 1969 : 158 [as a subgenus of *Lacon*]. Type-species: *Adelocera longicornis* Champion, by original designation. **Syn. n.**

*Latilacon* Golbach, 1969 : 158 [as a subgenus of *Lacon*]. Type-species: *Adelocera laticollis* Candèze, by original designation. **Syn. n.**

**GENERIC DIAGNOSIS.** Each tarsal claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepimeron forms part of margin of mesocoxal cavity; metepisternum does not form part of margin of mesocoxal cavity (Text-fig. 3). Second and third antennal segments not subequal, the third resembles the fourth in shape though it may be slightly smaller in size (Text-fig. 14). Antennal groove of variable depth, extending at least half the length of the prosternopleural suture and in many species attaining the anterior coxae. Body clothed with narrow scales or setae. Prothorax not constricted behind anterior angles; lateral carinae present. Propleurae with or without grooves or depressions for the accommodation of the anterior tarsi. Metasternum with or without depressions for the accommodation of the middle tarsi, but never with well defined grooves. Scutellum simple, without longitudinal carina. Tarsi simple, without ventral lobes.

**RANGE OF VARIATION FOUND WITHIN THE GENUS.** Species possessing this combination of diagnostic characters display a wide range of variation in the appearance of the antennae and the surface of the pronotum and elytra, the type of body vestiture (scales or setae), its colour and distribution, the length and depth of the antennal and tarsal grooves or depressions and the appearance of the mesosternal groove.

Up to the present time these characters have been used, either singly or in combination with one another, as the diagnostic features of a number of genera and subgenera. While these may appear justified in works dealing with restricted faunas, examination of material from all parts of the world has shown the existence of so many intermediate forms that it is clear that there is no justification for the retention of the 18 genera and 4 subgenera which are here newly placed in synonymy with *Lacon*.

**HISTORY OF THE GENUS.** The genus *Lacon* was established by Castelnau in 1836 for '*Elater atomarius, varius, fasciatus*, etc., de Fabricius [sic].' Germar (1840 : 260) redefined the genus and though he credits it to 'Lap. [Laporte de Castelnau]' he does not include the three originally included species. Germar transferred *atomarius* to *Agrypnus* and *varius* and *fasciatus* to *Adelocera*. Germar's interpretation of *Lacon* included *E. caliginosus* Boisduval, *E. muticus* Herbst,

*L. terrenus* Germar, ?*E. parviceps* Schoenherr, *E. crenatus* Klug, *L. turbidus* Germar, *E. murinus* Linnaeus, *E. vestitus* Klug, *L. mustellinus* Germar, *E. irroratus* Klug, *A. crenicollis* Ménériés and also *E. ovalis* Germar. Thomson (1859 : 103) designated *murinus* Linnaeus as the type-species. This interpretation of *Lacon* was generally accepted until Hyslop (1921 : 652) drew attention to the fact that *murinus* was not originally included in the genus and designated *E. atomarius* Fabricius [= *Lacon punctatus* (Herbst) see p. 76] as the type-species of *Lacon*.

Hyslop (1921 : 621) remarks that [as a result of his studies] the application of the names *Adelocera* and *Lacon* have been reversed but as he does not make it clear which species are to be included in each genus, I have accepted Fleutiaux's 1926 correction of the Schenkling catalogue as the date of publication of the new combinations.

Golbach (1969) appears to have been unaware of Fleutiaux's correction to the Schenkling catalogue as he records as new combinations many of the species previously transferred by Fleutiaux.

NOTES ON THE GENERA AND SUBGENERA NEWLY PLACED IN SYNONYMY WITH *Lacon*. *Ocneus* Candèze was erected for a single Brazilian species, *limbatus* Candèze, in which antennal segments are strongly transverse, the antennal grooves shallow and the pronotum distinctly bituberculate. Examination of the type-material (p. 69) has shown that the antennal segments of the male are more strongly transverse than those of the female. This sexual dimorphism also occurs, though to a less marked degree, in *punctatus* Herbst, the type-species of *Lacon*. The other diagnostic characteristics of the genus are all of the variable type discussed above.

*Scelisus* Candèze. Candèze considered this genus to be related to his interpretation of *Corymbites*. Examination of the type-material of the type-species, *sanguineus* Candèze (see p. 81) from Nepal has shown that this species possesses all the diagnostic characteristics of *Lacon*. The species differs from *L. punctatus* (Herbst) in that the antennal grooves do not extend beyond the mid point of the sternopleural sutures and the vestiture is setose and not scale-like. These characteristics also occur in *L. vitalisi* (Fleutiaux) from Laos, and the Madagascan *L. madida* (Candèze).

*Alaotypus* Schwarz was erected for two species from Tonkin (*subpectinatus* Schwarz, *aspersus* Schwarz) in which the antennal grooves are shallow and do not extend beyond the middle of the sternopleural sutures. The length and depth of this groove is now known to vary from one species to another and are believed by the writer to be of no value at the generic level.

Fleutiaux (1918 : 183) placed *Alaotypus* in synonymy with his interpretation of *Adelocera* (*Adelocera* sensu auctt., nec Latreille) but in his key (1941 : 48) to the Agrypnitae he treats it as a valid genus. The most recent workers, Ohira (1969b : 41) and Golbach (1969b-155) also treat *Alaotypus* as a valid genus, but the present writer does not consider the diagnostic characteristics to be of sufficient value to justify the retention of the genus.

*Sulcilacon* Fleutiaux was established for three species from south-east Asia (*sanguineus* (Fleutiaux) = *mausoni* nom. n., *spurcus* (Candèze) and *geographicus*

(Candèze)) which possess well defined propleural tarsal grooves. The degree of development of these grooves is known to vary from one species to another. Similar grooves are found in the majority of species originally included in *Diphyaulon* (q.v.).

*Diphyaulon* Arnett was proposed as a subgenus of *Lepidotus* [= *Lacon* in the present work] for species in which the pronotum has a pronounced median longitudinal furrow and 'usually' with well defined propleural tarsal grooves. These characteristics are of value at the specific level only and there is no justification for the retention of *Diphyaulon*, even as a subgenus.

*Aulacon* Arnett. The three species attributed to this subgenus of *Lepidotus* [= *Lacon* of the present work] do not differ from *L. punctatus* (Herbst) in any significant way. In my opinion, Arnett's distinguishing characteristic, the absence of a pronounced median longitudinal furrow on the pronotum, is of no value at the generic, or even subgeneric, level.

*Zalepia* Arnett was erected for those American species with shallow tarsal grooves on the propleurae and an irregular pronotal surface. These characters are very variable and of no value at the generic or subgeneric level.

*Kobulacon* Chujo & Ohira. The type-species *quadrinodatus* Lewis possesses all the diagnostic features of *Lacon*. It differs from the type-species *punctatus* (Herbst) only by such very variable characters as the presence of tubercles on the pronotum and shallow propleural tarsal grooves.

*Lepidelater* Smith was erected for a single species *misticus* Mignot. Despite the author's comment that the genus resembles *Lanelater*, the type-species is a synonym of *Lacon subcostata* (Candèze).

*Arnettia* Golbach. The genus is based on an error in the original description of the type-species. The second antennal segment is small, not large and triangular, like the third.

*Monocyrtion* Golbach. Only the presence of a posterior median tubercle on the pronotum distinguishes the members of this subgenus from *L. punctatus* (Herbst), the type-species of *Lacon*. Prothoracic tubercles, either singly or in pairs, occur in a large number of species and are of no value at the generic or even subgeneric level.

*Cornilacon* Golbach. The subgenus is characterized by the antennal grooves which are deep anteriorly and shallow posteriorly. This character which occurs, developed to a greater or less degree, in many species throughout the world, is too variable to justify the retention of the subgenus.

*Latilacon* Golbach. This South American subgenus was erected on the basis of the poorly defined propleural tarsal grooves and the presence of tubercles on the prothorax. The Japanese subgenus *Kobulacon* was based on the same variable characteristics.

SEXUAL DIMORPHISM. Members of the genus do not show any marked sexual dimorphism. In some species, including the type-species, *L. punctatus* (Herbst),

the antennae of the male are a little longer and the segments slightly more transverse than those of the female.

**DISTRIBUTION.** The largest number of species occur in the New World and in the Oriental region and the fewest in Africa. Neboiss (1956) lists a large number of Australian *Lacon* species but all those known to me (approximately half Neboiss's total) with the exception of *modestus* (Boisduval) belong to *Agrypnus* as defined in this work. *L. modestus* (Boisduval) appears to be widespread, though not common, in the tropics. As far as is known all the other species are comparatively limited in their distribution.

**BIOLOGY AND HABITS.** Very little is known of the biology and habits of the members of this genus.

The adults of the European species are generally found under the bark or in the decaying stumps of coniferous trees. Adults of *modestus* (Boisduval) (Fleutiaux, 1947 : 275) and of certain American species (Kirk, 1922) have been found under the bark and in wood-borer galleries in the timber of deciduous trees. The larvae have been found in the same places. Those of *L. marmoratus* (Fabricius) are known to feed on Bostrychid larvae (Kirk, 1922) and it seems probable that the larvae of other species are also predaceous on wood-boring larvae.

#### SPECIES INCLUDED IN THE GENUS

The following 106 species known to me are congeneric with the type-species *Elater atomarius* Fabricius (= *Lacon punctatus* (Herbst)).

#### ***Lacon altaicus* (Candèze) comb. rev.**

*Adelocera altaica* Candèze, 1881 : 2.

*Lacon altaicus* (Candèze) Fleutiaux, 1926 : 93.

*Adelocera altaica* Candèze; Tscherepanov, 1957 : 187.

The description is based on an unrecorded number of specimens from Altai standing as *lepidoptera* in the Gebler collection. I have not seen this material, which may be in the MNHN, Paris; ZI, Leningrad (Horn, 1935 : 87); or IRSNB, Brussels (Fleutiaux, 1945 : 81).

The generic attribution is based on the description.

#### ***Lacon antennatus* (Lewis)**

*Adelocera antennata* Lewis, 1894 : 27.

*Lacon antennatus* (Lewis) Fleutiaux, 1926 : 93.

Holotype. JAPAN: ♀, Sap. [on underside of card mount = Sapporo]; *Adelocera antennata* Lewis, type [Lewis]; Japan. G. Lewis 1910.320 (BMNH).

#### ***Lacon argentatus* (Candèze) comb. n.**

*Opatelus argentatus* Candèze, 1874 : 42.

LECTOTYPE (present designation). BRAZIL: ? ♀, Bates coll. Ega; Janson coll. 1903.130; *Opatelus argentatus mihi* [sic] n. sp. [Janson] Candèze [Gahan]

(BMNH). The absence of a Candèze determination label may be due to the fact that Candèze accepted Janson's name and did not trouble to affix a label himself.

The specimen lacks two features which are characteristic of the genus *Opatelus*. The third antennal segment does not resemble the second and there are no tarsal grooves on the metasternum. It must be assumed that the very small size of the specimen (4 mm) led Candèze to make this mistake in the generic attribution.

***Lacon aspersus* (Schwarz) comb. rev.**

*Alaotypus aspersus* Schwarz, 1902 : 309.

*Adelocera brevicornis* Fleutiaux, 1906b : 211. [Synonymized by Fleutiaux, 1918d : 186.]

*Adelocera adspersa* Fleutiaux, 1918d : 186 [unjustified emendation].

*Lacon aspersus* (Schwarz) Fleutiaux, 1926 : 93.

*Alaotypus aspersus* Schwarz; Fleutiaux, 1927 : 62.

*Alaotypus aspersus* Schwarz. Holotype. NORTH VIETNAM: ? ♀, Tonkin, Montes Mauson. ? DEI, Eberswalde.

*Adelocera brevicornis* Fleutiaux. LECTOTYPE (present designation). NORTH VIETNAM: ♀, Tonkin, Montes Mauson, April–Mai, 2300 [metres], H. Fruhstorfer; *Adelocera brevicornis* Fleut., Type [Fleut.]; Bull. Soc. Ent. Fr. 1906 p. 211 [Fleut.] (MNHN, Paris).

This is a distinctive and easily recognizable species and I have therefore accepted Fleutiaux's synonymy. Both species are from the same locality and may well be part of the same series.

***Lacon atterimus* (Candèze)**

*Adelocera atterima* Candèze, 1889 : 70(4).

*Lacon atterimus* (Candèze) Fleutiaux, 1926 : 95.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Museum Paris; *Adelocera atterima* Cand. [Cand.] Candèze vident (MNHN, Paris).

***Lacon auroratus* (Say) comb. rev.**

*Elater auroratus* Say, 1839 : 181.

*Lacon auroratus* (Say) Fleutiaux, 1926 : 93.

*Zalepia aurorata* (Say) Arnett, 1969 : 11.

LECTOTYPE (present designation). U.S.A.: ♀, 931, N.H. [Harris, refers to his notebook = *Elater* (*Taphiacerus*) *auroratus* S. n.sp./near *marmoratus* in form of prothorax] (MCZ, Harvard).

The description is based on an unrecorded number of specimens from New Hampshire submitted by Dr Harris. There are no specimens in the Say collection in the ANS, Philadelphia (see p. 279). The specimen measures 13 mm compared with the published length of 'eleven-twentieths of an inch' [= 14.3 mm].

The date of publication of the description is 1839 (not 1836) but it may have appeared earlier, see note in the list of references p. 295.

I am greatly indebted to Professor Darlington for locating this specimen and supplying me with the data from Harris's notebook.

***Lacon aurulentus* (Candèze)**

*Adelocera aurulenta* Candèze, 1865 : 6.

*Lacon aurulentus* (Candèze) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). CEYLON: ♀, Janson coll. ex Candèze, 1903. 130; *Adelocera aurulenta* Cdz. Ceylon, Nietn. [Cand.]; *Adelocera aurulenta* Cand. Ceylon [Gahan] (BMNH).

Paralectotype. CEYLON: 1 ♀, Neitner Ceylon; Janson coll. 1903.130; *Adelocera aurulenta* Cdz. (El.n.) [Janson] (BMNH).

***Lacon avitus* (Say) comb. rev.**

*Elatey avitus* Say, 1839 : 182.

*Lacon avitus* (Say) Fleutiaux, 1926 : 93.

*Aulacon avitus* (Say) Arnett, 1969 : 11.

The description is based on an unrecorded number of specimens from Indiana [U.S.A.]

Type-material. As this cannot be found in the ANS, Philadelphia, it must be regarded as lost. For notes on the Say collection see p. 279.

The generic attribution is based on the following specimen: 1 ♀, Ky.; *avita* Say; Andreas Bolter collection (BMNH).

The description of this species may have appeared before 1839; see note in the Bibliography, p. 295.

***Lacon bicolor* Fleutiaux**

*Lacon (Adelocera des auteurs) bicolor* Fleutiaux, 1940a : 90.

LECTOTYPE (present designation). CHINA: ♂, Yunnan; *Lacon bicolor* Fleut., type. *Adelocera* [Fleut.] (MNHN, Paris).

***Lacon bulwensis* (Fleutiaux)**

*Adelocera bulwensis* Fleutiaux, 1919 : 10.

*Lacon bulwensis* (Fleutiaux) Fleutiaux, 1926 : 23.

LECTOTYPE (present designation). TANZANIA: ♀, Bulwa, Usumbara; H. Rolle. Berlin, S.W.11; *Adelocera bulwensis* Fleut., type [Fleut.]; Fleut. Voy. All. et Jeann. Afr. or. Elat. p. [Fleut.] (MNHN, Paris).

***Lacon calabaricus* (Candèze)**

*Adelocera calabarica* Candèze, 1874 : 23.

*Lacon calabaricus* (Candèze) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). NIGERIA: ♀, Old Calabar; Janson coll. 1903.130; *Ad. calabarica* Cdz. n. sp., type [Cand.]; *Adelocera calabarica* Cand., type ♀ [Gahan] (BMNH).

***Lacon candezei* (Desbrochers des Loges)**

*Adelocera candezei* Desbrochers des Loges, 1875 : 37.

*Lacon candezei* (Desbrochers des Loges) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). JORDAN: ♂, Naplouse [Nablus]; *candezei* m. [Desbr.] (MNHN, Paris).

Schwarz (1894 : 145) synonymizes *Adelocera kraatzii* Schwarz (1893 : 192) from Jerusalem with *candezei*. The type-material of *kraatzii* is probably in the DEI, Eberswalde (see p. 280). The synonymy has not been confirmed.

***Lacon candidus* (Fall) comb. rev.**

*Adelocera candida* Fall, 1932 : 59.

*Lacon (Zalepia) candidus* (Fall) Arnett, 1953 : 7.

*Zalepia candida* (Fall) Arnett, 1969 : 11.

Holotype U.S.A.: ♂, Baboquiv. Mts., Ariz. ix/15-30/23; Type. *candida* [Fall]. M.C.Z. Type 24350 (MCZ, Harvard.)

***Lacon carinensis* (Candèze)**

*Adelocera carinensis* Candèze, 1891a : 772.

*Lacon carinensis* (Candèze) Fleutiaux, 1926 : 93.

Holotype. BURMA: ♂, Carin, Ghecu, 1300-1400 m.s.m. Febbraio-Marzo 1888, legit L. Fea. (MCSN, Genoa according to Binaghi, 1941c : 122. Not confirmed). Candèze records the locality as: Toungoo; montagnes de Carin, dètroit de Ghecu: 1300-1400 metres, mars.

The generic attribution is based on the description.

***Lacon castelnaui* (Candèze)**

*Adelocera castelnaui* Candèze, 1889 : 71.

*Lacon (Monocyrtion) castelnaui* (Candèze); Golbach, 1969b : 157.

The description is based on two specimens collected at Bahia [Brazil] by Leconte de Castelnau.

Syntypes: ?IRSNB, Brussels.

The generic attribution is based on the description.

***Lacon chabannei* (Guérin-Méneville)**

*Adelocera chabannei* Guérin-Méneville, 1829 : pl. 12, fig. 4; 1844 : 41.

*Alaus flammula* Blanchard, 1841 : pl. 8, fig. 5; 1845 : 136. [Synonymized by Candèze, 1857 : 65.]

*Lacon (Monocyrtion) chabannei* (Guérin-Méneville); Golbach, 1969b : 157.

*Adelocera chabannei* Guérin-Méneville. The material on which Guérin-Méneville based his drawings, which he made under Latreille's supervision (Cuvier, 1832 : 333)

has not been located. It may be in the MNHN, Paris or in his own collection in the IRSNB, Brussels. The published locality is 'L'intérieur du Brésil'.

The generic attribution is based on material in the BMHN which agrees well with the figure.

Latreille (1834 : 144) states that plate 12 was issued in fascicle 4 of Guérin-Méneville's work. The appearance of this fascicle is recorded in the *Bibliographie de France*, 1829 (November 21) : 783. Fascicles 46-50 containing the text were published in 1844.

*Alaus flammula* Blanchard. LECTOTYPE (present designation). BOLIVIA: ♀, *A. flammula* Blanch. M. D'Orbigny, Chiquitos; type de E. Blanchard [Fleut.] (MNHN, Paris).

Blanchard records the locality as 'M. d'Orbigny a pris ce bel insecte sur les troncs d'arbres dans la province de Guarayos'. Chiquitos is a district in the Llanos de Guarayos.

The date of publication of this species is generally given as 1837-1843, the date appearing on the title page of the volume in which the description appeared. Sherborn and Griffin (1935) who had access to a copy of the whole work in its original wrappers have shown that volume 6, part 2 appeared in 37 livraisons between 1836 and 1845. The dates on which the figure and description of this species were published were obtained from Sherborn and Griffin.

### ***Lacon chilensis* (Solier)**

*Agrypnus chilensis* Solier, 1851 : 7; pl. 13, fig. 1.

*Lacon (Aulacon) chilensis* (Solier); Golbach, 1969b : 157.

LECTOTYPE (present designation). CHILE: ♀, *Agrypnus chilensis* Sol., Chile [?Solier]; Type de Solier [Fleut.] (MNHN, Paris).

The published locality is 'Valdivia cerca de San José.'

### ***Lacon cinctus* (Candèze)**

*Adelocera cincta* Candèze, 1878b : LII (6).

*Lacon cinctus* (Candèze) Fleutiaux, 1926 : 93.

The description is based on an unrecorded number of specimens from Sumatra. Type-material: ?IRSNB, Brussels.

The generic attribution based on the following specimen: 1 ♀, Marol [?, illegible] 83 : 33 [BMNH registration number = Timor Laut (= Kepulauan Tanimbar) H. O. Forbes]; *Adelocera cincta* Candz. (BMNH).

### ***Lacon coeca* (Candèze)**

*Adelocera coeca* Candèze, 1874 : 18.

*Lacon (Zalepia) coeca* (Candèze); Golbach, 1969b : 159.

LECTOTYPE (present designation). GUATEMALA: ♂, Izabal; *A. coeca* Cdz. n.sp. type [Cand.]; Guatamala, Sallé coll; *Adelocera coeca* Cand., Sallé coll. 1413

[refers to catalogue of Sallé collection where specimen is recorded as the type];  
B. C. A. Col. III (1) *Adelocera coeca* Cand. [Champion] (BMHN).

***Lacon cognatus* (Candèze)**

*Adelocera cognata* Candèze, 1892a : 796.

*Lacon cognatus* (Candèze) Fleutiaux, 1926 : 93.

Holotype. ENGGANO: ♂, Bua-Bua, collected by Modigliani, May-June, 1891, and submitted to Candèze by Gestro. (MCSN, Genoa according to Binaghi, 1941c : 118, Not confirmed.)

***Lacon constellatus* (Fleutiaux)**

*Adelocera constellata* Fleutiaux, 1906b : 212.

*Lacon constellatus* (Fleutiaux) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). JAVA: ♀, Java; *constellata* Fleut., type [Fleut]; Bull. Soc. ent. Fr. 1906 p. 212 [Fleut.] (MNHN, Paris).

***Lacon cribratus* (Candèze)**

*Adelocera cribrata* Candèze, 1857 : 63; pl. 1, fig. 7.

*Adelocera lacerta* Candèze, 1865 : 7. [Synonymized by Candèze, 1874 : 25.]

*Lacon cribratus* (Candèze) Fleutiaux, 1926 : 93.

*Adelocera cribrata* Candèze. The description is based on a single specimen believed to be from Guiana or Brazil in the Guérin-Ménéville collection. Eight years later Candèze (1865 : 7) stated that he believed it to be from Poulo-pinang [Penang, Malaya], and also (1874 : 25) that he has seen a number of specimens from Malacca in the de Castelnau collection.

Type-material: ?IRSNB, Brussels.

*Adelocera lacerta* Candèze. LECTOTYPE (present designation). MALAYA: ♂, Malacca; Janson coll., ex Candèze, 1903.130; *Adelocera lacerta* Cdz, Malacca Cast. Cand.; *Adelocera lacerta* Cand. Malacca [Gahan] (BMNH).

The species is distinctive and easily recognizable and for this reason I have accepted Candèze's synonymy.

***Lacon cristatus* (Fleutiaux)**

*Adelocera cristata* Fleutiaux, 1918a : 206.

*Lacon cristatus* (Fleutiaux) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). SOUTH VIETNAM: ♀, Museum Paris, Cochinchine, Lemesle, 1865; *Adelocera cristata* Fleut. co-type [Fleut.] (MNHN, Paris).

Paralectotype. ♀, Sumatra, Palembang; *Adelocera cristata* Fleut., co-type [Fleut.] (MNHN, Paris).

***Lacon cuneatus* (Candèze) comb. n.**

*Dilobitarsus cuneatus* Candèze, 1865 : 8.

LECTOTYPE (present designation). FRENCH GUIANA: ♂, Bar. Cayenne; Janson coll. 1903 : 130; *Dilobitarsus cuneatus* Cdze. Type (El.n) (e coll. de Mniszech) [Janson] (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Lacon delagrangi* (Buysson)**

*Adelocera delagrangi* Buysson, 1891 : 134.

*Lacon delagrangi* (Buysson) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). SYRIA: ♀, Syrie, Amanus C.D. 1891; *Adelocera delagrangi* nov. sp. [Buyss.] (MNHN, Paris).

***Lacon discoidea* (Weber) comb. rev.**

*Elater discoidea* Weber, 1801 : 77.

*Elater pennata* Fabricius, 1801 : 239. [Synonymized by Schoenherr, 1817 : 302.]

*Lacon discoidea* (Weber) Fleutiaux, 1926 : 93.

*Zalepia discoidea* (Weber) Arnett, 1969 : 11.

*Elater discoidea* Weber. The description was based on an unrecorded number of specimens from 'America boreali'. Weber's types are presumed lost or destroyed (Lane, in litt.).

*Elater pennata* Fabricius. LECTOTYPE (present designation). U.S.A.: ♀, [abdomen damaged by *Anthrenus*] *pennata* Fab. Caroline, coll. Bosc. [? Bosc, on green paper] (MNHN, Paris).

Schoenherr regards *pennata* as the valid name, but since Fabricius (1801 : 252) refers to Weber under *Lucanus piceus*, it seems probable that his work appeared after that of Weber.

The species is distinctive and there is no good reason why the traditional synonymy should be rejected.

***Lacon distinctus* (Fleutiaux) comb. rev.**

*Adelocera distincta* Fleutiaux, 1920a : 114.

*Lacon distinctus* (Fleutiaux) Fleutiaux, 1926 : 93.

*Alaotypus distinctus* (Fleutiaux) Ohira, 1970b : 230.

Holotype. LAOS: ♂, Xieng-Khouang, 12.5.19 Vitalis de Salvaza; *Adelocera distinctus* Fleut; type [Fleut.] (MNHN, Paris).

***Lacon dorsalis* (Candèze)**

*Adelocera dorsalis* Candèze, 1857 : 62; p. 1, fig. 4.

*Lacon dorsalis* (Candèze) Fleutiaux, 1926 : 95.

Syntypes examined. MADAGASCAR: 1 ex., Laf. Madagascar; *Adelocera dorsalis* Cdze., Cand., type [Janson]; Janson coll. 1903. 130; nov. sp. Madag. Goudot (BMHN). The absence of Candèze's determination label is probably due to Janson (see p. 276). 1 ♀, Collection Chevrolat; *dorsalis* Cand., type [Fleut.]; Coll. Chevr. co-type Cand. Mu. [Fleut.]. The specimen stands over a blue Chevrolat label: *Adelocera dorsalis* Cand., Mon. 1, 1857, p. 42. 16. Madagascar (MNHN, Paris). There is no Candèze determination label. It may have been removed by Chevrolat.

Candèze also refers to material in the Mniszech collection. ? IRSNB, Brussels.

Fleutiaux (1903b : 263) described var. *obscuripennis* based on an unrecorded number of specimens from: Region des Diego Suarez, montagne d'Ambre. This material has not been located. ? MNHN, Paris.

According to Fleutiaux (1907a : 162), *Adelocera auricollis* Schwarz (1905b : 273) described from the same locality as var. *obscuripennis* is a synonym. Syntype-material: ? DEI, Eberswalde. The synonymy has not been confirmed.

### ***Lacon drusa* (Marseul) sp. rev.**

*Adelocera drusa* Marseul, 1870 : 380.

*Adelocera bruleriei* Desbrocheres des Loges, 1875 : 37. **Syn. n.**

*Adelocera drusa* Marseul. LECTOTYPE (present designation). SYRIA: ♂, *Adelocera drusa* Kar-Eliz [sic] remainder of label illegible [Marseul]; Museum Paris. coll. de Marseul, 1890 (MNHN, Paris). The published locality is Kab-Elias, Syria.

*Adelocera bruleriei* Desbrocheres des Loges. LECTOTYPE (present designation). LEBANON: ♀, Liban; Brulerie [sic] m. [Desbrocheres] (MNHN, Paris).

*Adelocera drusa* Marseul is not a synonym of *A. graeca* Candèze. Schenkling's (1925 : 10) synonymy is presumably based on Candèze's (1874 : 21) comment that *drusa* resembles *graeca*.

### ***Lacon dubius* Candèze comb. rev.**

*Lacon dubius* Candèze, 1857 : 160; pl. 2, fig. 6.

*Pyrganus dubius* (Candèze) Golbach: 1968: 198.

LECTOTYPE (present designation). COLOMBIA: ♀, Columbia [sic., Janson]; Janson coll. 1903. 130; *Lacon dubius* Cand. e coll. Lacord. Candèze, type [Janson]; *L. dubius* Cand. type [Cand.] (BMNH).

The published locality is 'Colombie' [S. America]. The discrepancy between the published locality and the label is probably due to Janson.

The structure of the fourth tarsal segments, which are strongly oblique at the apex, suggests that the retention of *Lacon* and *Dilobitarsus* as separate genera is not entirely justified. However, this problem cannot be resolved until more material becomes available.

### ***Lacon expansus* (Fleutiaux)**

*Adelocera expansa* Fleutiaux, 1920a : 114.

*Lacon expansus* (Fleutiaux) Fleutiaux, 1926 : 93.

Holotype. N. VIETNAM: ♀, Hoa Binh, Tonkin Vitalis, Janv. 17; Hoa Binh, Tonkin de Cooman; non Vitalis sed P. de Cooman, *Adelocera expansa* Fleut., type [Fleut.] (MNHN, Paris).

***Lacon fleutiauxi* (Schwarz)**

*Adelocera fleutiauxi* Schwarz, 1902a : 311.

*Lacon fleutiauxi* (Schwarz) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). EQUATORIAL GUINEA: ♂, Benito, Congo Franc.; *Adelocera fleutiauxi* n. sp. [Schw.]; *fleutiauxi* Schwarz, type [Fleut.]; *Sulcilacon fleutiauxi* Schw., type ♂ [Girard] (MNHN, Paris).

The transference of this species to *Sulcilacon* has not been published.

***Lacon foveatus* (Candèze)**

*Adelocera foveata* Candèze, 1895b : 52.

*Lacon foveatus* (Candèze) Fleutiaux, 1926.93.

The description is based on a single specimen from Tamatave, Madagascar, collected by Alluaud between April and August, 1893.

Holotype: The specimen cannot be found in the MNHN, Paris. ? IRSNB, Brussels.

The generic attribution is based on a note under *olsonfieffi* Fleutiaux in the Fleutiaux collection (MNHN, Paris) 'foveata Cand. comparé au type, Janv. '42.'. The synonymy has not been published or confirmed.

***Lacon fulvipennis* Fleutiaux**

*Lacon fulvipennis* Fleutiaux, 1932a : 49.

Holotype ♂. MADAGASCAR: Museum Paris, Madagascar, Prov. de Fénérive, Reg. de Soaniérana, A. Mathieux 1905; *fulvipennis* Fleut., type [Fleut.] (MNHN, Paris).

***Lacon funebris* (Solsky)**

*Adelocera funebris* Solsky, 1881 : 231.

*Lacon funebris* (Solsky) Fleutiaux, 1926 : 3.

The description is based on an unrecorded number of specimens from 'valle Sarafschan' [= Zeravshan, TADZHIKISTAN S.S.R].

The type-material is probably in the ZMV, Moscow (E. B. Britton in litt.).

The generic attribution is based on the following specimen: TURKESTAN, 9-15.vii.1960, determined by Skopin (BMNH).

Schenkling (1925 : 9) records the date of publication of this species as 1882, apparently referring to a separate with pagination 1 →. The separate is unknown to me. There seems to be no reason why the date on the title-page of the *Horae Soc. ent. ross.* 7 should not be accepted.

Candèze (1891 : 13) records *Adelocera tristis* Kraatz (1882 : 319) as a synonym of *funebri*. The synonymy has not been confirmed.

*Adelocera tristis* Kraatz. The description is based on an unrecorded number of specimens ('ziemlich selten') collected by Haberhauser near Samarkand.

Type-material: ?Kraatz collection, DEI, Eberswalde (Horn, 1935; 141).

***Lacon ganglbauri* (Schwarz)**

*Adelocera ganglbauri* Schwarz, 1894 : 145.

*Lacon ganglbauri* (Schwarz) Fleutiaux, 1926 : 93.

The description is based on two specimens from Beirut [LEBANON], Appl., 1878 in the NM, Vienna.

The generic attribution is based on the description.

***Lacon geographicus* (Candèze) comb. rev.**

*Adelocera geographica* Candèze, 1865 : 7.

*Lacon geographicus* (Candèze) Fleutiaux, 1926 : 93.

*Sulcilacon geographicus* (Candèze) Fleutiaux, 1941c : 48.

LECTOTYPE (present designation). BORNEO: ♂, Borneo 1426; Sar. 874; Janson coll. 1903.130; *Adelocera geographica* Cdz. [Cand.]; *Adelocera geographica* Cand., type [Gahan] (BMNH).

***Lacon graeca* (Candèze)**

*Adelocera graeca* Candèze, 1857 : 61.

*Lacon graeca* (Candèze) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). ♂, *graeca* type [Fleut.]; *graeca* Cand. type, Collection Chevrolat; [Fleut.]. The specimen stands beside a Chevrolat label: *Adelocera graeca* (Chev.) Cand. Mon.1. 1857 p. 61 13. Coll. Chevrolat (MNHN, Paris.)

The published locality is 'Grèce' [GREECE].

***Lacon impressicollis* (Say) comb. rev.**

*Elater impressicollis* Say, 1825 : 260.

*Adelocera senilis* Germar, 1840 : 259. [Synonymized by Candèze, 1859 : 58.]

*Adelocera impressicollis* (Say) LeConte, 1853 : 490.

*Lacon impressicollis* (Say) Fleutiaux, 1926 : 490.

*Zalepia impressicollis* (Say) Arnett, 1969 : 11.

*Elater impressicollis* Say. Say proposed this name for *Elater fuscus* Melsheimer (1806 : 44, nomen nudum) which he regarded as preoccupied, presumably by *Elater fuscus* Fabricius (1801). Say does not record a locality or state whether he based his description on Melsheimer's specimens or on material in his own collection. Say's own material is presumed lost (see p. 279). Horn (1936 : 127) states that

Melsheimer's collection is in the MCZ Harvard but up to the present time the specimens have not been located.

The interpretation of the species is based on a specimen determined by LeConte: 1 ♂, yellow disk (= Western States); *A. impressicollis* (Say) LeC. *lepturus* Say, *senilis* Germar [LeConte]; *Adelocera impressicollis* Say (MCZ, Harvard).

*Adelocera senilis* Germar. LECTOTYPE (present designation). U.S.A.: ♂, H [on green triangular label, ? = Hertz, see below]; North America; Janson coll. ex Schaum, 1903.130; *senilis* m. *lepturus* Say. Amer. bor. 879<sup>b</sup> [Germar] (BMNH).

Germar received the material from Virginia, on which he based his description, from Zimmerman and Hertz. The appearance of the name '*lepturus* Say' on the label is puzzling. The explanation may be that Germar learned of LeConte's (1859a : 620) synonymy and altered or replaced his original determination label.

LeConte (1859a : 182) states that *E. lepturus* Say (1836 : 128) does not differ from *impressicollis*. The description of *Elater lepturus* is based on an unrecorded number of specimens from 'Pennsylvania, Indiana and North Carolina. Harris'. As the material cannot be found in the Say collection (see p. 279) in the ANS, Philadelphia or the Harris collection (see p. 276) in the MCZ, Harvard, the type material must be presumed to be lost. The synonymy cannot therefore be confirmed.

### ***Lacon inaequalis* (Candèze)**

*Adelocera inaequalis* Candèze, 1857 : 67.

*Lacon (Aulacon) inaequalis* (Candèze); Golbach, 1969b : 157.

LECTOTYPE (present designation). COLOMBIA: ♀, Columb. [sic] Dup. 29; Collection Chevrolat; *inaequalis* Cand., type [Fleut.]; *Adelocera inaequalis* (Chev.) Cand., type Mon.1. 1857 p. 67. 21 Nova Grenada. D. Dupont [Chevrolat] (MNHN, Paris).

The published locality is 'Nouvelle Grenade' the name by which Colombia was known between 1831 and 1861.

### ***Lacon incommodus* Fleutiaux**

*Lacon incommodus* Fleutiaux, 1934e : 364.

LECTOTYPE (present designation). PHILIPPINES: ♂, Davao, Mindanao, Baker; *Lacon incommodus* Fleut., type ex *Adelocera* [Fleut.] (MNHN, Paris).

This species has never been included in the genus *Adelocera*.

### ***Lacon incomptus* (Kraatz)**

*Adelocera incompta* Kraatz, 1832 : 319.

*Lacon incomptus* (Kraatz) Fleutiaux, 1926 : 93.

The description is based on an unrecorded number of specimens collected by Haberhauser near Samarkand [UZBECK S.S.R.].

Type-material: ? Kraatz collection, DEI, Eberswalde (Horn, 1935 : 141).

The generic attribution is based on Kraatz's comment that the species bears a very close resemblance to *tristis* Kraatz (see *funnebris* Solsky, p. 65).

***Lacon inflatus* (Candèze)**

*Adelocera inflata* Candèze, 1857 : 62.

*Lacon inflatus* (Candèze) Fleutiaux, 1926 : 95.

LECTOTYPE (present designation). MADAGASCAR: ♀, Deyr. Madagascar; Ad. inflata [Cand.]; *Adelocera inflata* Cdze, Cand., type (e coll. Deyrolle) [Janson] (BMNH).

Paralectotypes: 2 ex., Laf. Madagascar; *Adelocera inflata* Cdze, Cand. [Janson]; *A. nigromicans* Gory in mus. (e coll. de Laferté) [Janson]. One specimen bears an additional label = *nigromicans* Gory Madagas. [Gory] (BMNH).

***Lacon jacquieri* (Candèze)**

*Adelocera jacquieri* Candèze, 1857 : 64; p. 1. fig. 8.

*Lacon (Monocyrtus) jacquieri* (Candèze); Golbach, 1969b : 15.

LECTOTYPE (present designation). FRENCH GUIANA: ♀, Dej. Cayenne; *Adelocera jacquieri* (Dej.) Cdze, Cand., type [Janson]; *Agryp. jacquieri* Dej. Cat. (e coll. Dejean) [Janson] (BMNH).

Paralectotype: ♀, labels as lectotype, but without the word 'type' on Janson's label.

The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Lacon jeanvoinei* Fleutiaux**

*Lacon jeanvoinei* Fleutiaux, 1941b : 184.

LECTOTYPE (present designation). N. VIETNAM: ♀, Chapa, Tonkin, ex Jeanvoine coll. Clermont; *Lacon (Adelocera) jeanvoinei* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. ♀, labels as lectotype but without Fleutiaux's determination label (MNHN, Paris).

***Lacon laconoides* (Schwarz) comb. n.**

*Scelusus laconoides* Schwarz, 1902a : 343.

The description is based on two specimens from N. VIETNAM: Tonkin, Montes Mauson.

Syntypes: ? DEI, Eberswalde.

The generic attribution is based on the description and the figure in Schwarz (1907 : pl. 6, fig. 7).

***Lacon laoticus* Fleutiaux**

*Lacon laoticus* Fleutiaux, 1927 : 68.

LECTOTYPE (present designation). LAOS: ♂, Ht. Mekong, Ba ni Hona 25.3.20; *Lacon laoticus* Fleut., type [Fleut.] (MNHN, Paris).

***Lacon laticollis* (Candèze)**

*Elater pulverulentus* Fabricius, 1801 : 228. [Junior primary homonym of *Elater pulverulentus* Panzer, 1795.]

*Adelocera laticollis* Candèze, 1857 : 59. **Syn. n.**

*Adelocera aberrans* Candèze, 1874 : 23. **Syn. n.**

*Arnettia aberrans* (Candèze) Golbach, 1969b : 155.

*Lacon* (*Latilacon*) *laticollis* (Candèze); Golbach, 1969b : 158.

*Elater pulverulentus* Fabricius. LECTOTYPE (present designation). GUYANA: ♂, small green label identifying Fabrician specimen (Zimsen, 1964 : 12) Type [curatorial label]; Essequibo. Smidt. Mus. D. Sehestedt. *Elater pulverulentus* Fab. [mss. label replacing Fabricius' label, see Zimsen, loc. cit.] (ZMU, Copenhagen).

The published locality is 'America meridionali. D. Smidt. Mus. D. de Sehestedt'.

This species has not appeared in any catalogue or other work since Schoenherr (1817 : 280).

*Adelocera laticollis* Candèze. Holotype. FRENCH GUIANA: ♂, Laf. Cayenne; Janson coll. 1903 : 130; *Adelocera laticollis* Cdze, Cand., Type (e coll. de Laferté) [Janson]; nov. sp. Cayenne, Mus. Reiche (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276).

*Lacon laticollis* (Candèze, 1857 : 59) is a junior secondary homonym of *Lacon laticollis* Candèze, 1857 : 146 = *Agrypnus laticollis* (Candèze) (see p. 274) but as the two species are not congeneric the junior name does not require replacement (IRZN, Art. 59 (b)).

*Adelocera aberrans* Candèze. LECTOTYPE (present designation). VENEZUELA: ♀, Caracas; *A. aberrans* Cdze. type [Cand.]; Ex Musen A. Sallé 1897; Museum Paris, 1952. Coll. R. Oberthur (NMHN, Paris).

Candèze's statement concerning the size of the second antennal segment is erroneous. It is not large and triangular like the third, but very small and moniliform. As the type material until recently stood unrecognised in the MNHN, Paris, it seems probable that Golbach based his interpretation of the species, for which he established the genus *Arnettia*, on Candèze's misleading description and not on authentically identified material.

***Lacon lepidopterus* (Panzer) comb. rev.**

*Elater lepidoptera* Panzer, 1801, part 76, no. 4.

*Lacon lepidoptera* (Panzer) Fleutiaux, 1926 : 93.

*Adelocera lepidoptera* (Panzer); Tscherepanov, 1957 : 189.

The description is based upon material 'Lectus semel Berolini [Berlin. EAST

GERMANY] in muro, mens. Jun. 1798 a Dom. Funk Pharmaop. Gsresensi-Baruth, qui eundem benevole mecum communicavit.' I have been unable to trace this material.

The generic attribution is based on material standing over this name in the major European collections.

***Lacon limbatus* (Candèze) comb. n.**

*Ocneus limbatus* Candèze, 1857 : 85; pl. 2, fig. 27.

LECTOTYPE (present designation). BRAZIL: ♂, Laf. Brazil; Janson coll. 1903 : 130; *Ocneus limbatus* [Cand.]; *Ocneus limbatus* Cdz. Cand. type ♂ [Janson] (BMNH).

Paralectotype. ♂, labels as lectotype but without Candèze's determination label (BMNH).

The lectotype, paralectotype and the seven other specimens known to me all differ from Candèze's generic diagnosis in that the posterior coxal plates are not wider laterally than in the mid line.

***Lacon linearis* (Candèze)**

*Adelocera linearis* Candèze, 1865 : 6.

*Lacon (Aulacon) linearis* (Candèze); Golbach, 1969b : 93.

LECTOTYPE (present designation). FRENCH GUIANA: ♂, Janson coll. 1903.130; Janson coll. ex Candèze; *Adelocera linearis* Cdz., Cay. De B. [Cand.]; *Adelocera linearis* Cand., Cayenne [Gahan] (BMNH).

***Lacon lithophilus* (Candèze)**

*Adelocera lithophila* Candèze, 1857 : 60.

*Lacon lithophilus* (Candèze) Fleutiaux, 1926 : 94.

The description is based on an unrecorded number of specimens from EGYPT received with this name from Dohrn. The BMNH collection does not possess any specimens with Dohrn's determination label or known to come from his collection.

Type-material: ?IRSNB, Brussels (Candèze collection) or IZPAN, Warsaw (Dohrn collection, see p. 274).

The generic attribution based on the following specimen: *Adelocera lithophila* Cdz. Egypt. Schaum [Cand.]; Janson coll. ex Candèze, 1903.130 (BMNH).

***Lacon longicornis* (Champion)**

*Adelocera longicornis* Champion, 1894 : 261.

*Lacon (Cornilacon) longicornis* (Champion); Golbach, 1969b : 158.

LECTOTYPE (present designation). GUATEMALA: ♂, Capetillo, Guatemala; B.C.A. Col. 111(1) *Adelocera longicornis* Ch. ♂ [Champ.]; sp. figured (BMNH).

Paralectotypes: 4 ♀, with same locality and determination labels as the lectotype (BMNH).

***Lacon luzonicus* (Candèze)**

*Adelocera luzonica* Candèze, 1875 : CXIX.

*Lacon luzonicus* (Candèze) Fleutiaux, 1926 : 93

The description is based on 1 ♂ and 1 ♀ from Luzon.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on Candèze's comment that the species resembles *A. aurulenta* Candèze (= *Lacon*, see p. 58).

***Lacon maculatus* (LeConte) comb. rev.**

*Adelocera maculata* LeConte, 1866 : 389.

*Lacon maculatus* (LeConte) Fleutiaux, 1926 : 93.

*Zalepia maculatus* (LeConte) Arnett, 1969 : 11.

LECTOTYPE (present designation). U.S.A.; ♀, Pen.; Type 2376 [MCZ curatorial label]; *A. maculata* Lec. [LeC.] (MCZ, Harvard).

Paralectotype: ♀, D.C.; *Adelocera maculata* LeC. [Ulke] (CM, Pittsburgh, Ulke collection).

The description is based on two specimens, one from Philadelphia [Pennsylvania] found by J. Johnson Brown and another from Washington, D.C., by Mr Ulke. Ulke appears to have been in the habit of affixing his own determination labels on specimens described by LeConte. See also *Lacon pyrsolepis* LeConte p. 78.

***Lacon madidus* (Candèze)**

*Adelocera madida* Candèze, 1889 : 70 (4).

*Lacon madidus* (Candèze) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). MADAGASCAR: ♀ Museum Paris, Madagascar, Humblot 1885; 6364, 85; *Adelocera madida* Cand. sp. n [Cand.] (MNHN, Paris).

***Lacon maklini* (Candèze) comb. rev.**

*Adelocera maklini* Candèze, 1865 : 6.

*Lacon maklini* (Candèze) Fleutiaux, 1926 : 93.

*Adelocera (Compsolacon) maklini* (Candèze); Van Zwaluwenburg, 1966 : 298.

The description is based on an unrecorded number of specimens from Japan received from Professor Maklin of Helsingfors University. Van Zwaluwenburg (1957 : 10) records a specimen 'which is probably the type' in the ZMU Helsinki.

The generic attribution is based on the following specimen: ♀, Japan G. Lewis, 1910 : 320; *Adelocera maklini* Cdze [Janson] (BMNH).

***Lacon mamillatus* (Candèze)**

*Adelocera mamillata*, Candèze, 1865 : 7.

*Lacon (Aulacon) mamillata* (Candèze); Golbach, 1969b : 157.

LECTOTYPE (present designation). FRENCH GUIANA: ♀, Bar. Cayenne, *Adelocera mamillata* Cdze, type (El. n.) (e coll. de Mniszech) (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Lacon marmoratus* (Fabricius) comb. rev.**

*Elater marmorata* Fabricius, 1801 : 227.

*Lacon marmorata* (Fabricius) Fleutiaux, 1926 : 95.

*Diphyaulon marmorata* (Fabricius) Arnett, 1969 : 11.

LECTOTYPE (present designation). U.S.A.: ♀, *marmorata* Fab. Caroline, Coll. Bosc [?Bosc on green paper] (NMHN, Paris).

Fabricius records the location of the material as Mus. D. Bosc. Zimsen (1964 : 158 No. 2629) records a specimen in the Kiel collection. This may be a syntype retained by Fabricius, or a subsequent addition to the collection (not examined).

***Lacon mausoni* nom. n.**

*Adelocera sanguinea* Fleutiaux, 1908 : 164.

*Sulcilacon sanguineus* (Fleutiaux) Fleutiaux, 1941c : 48.

*Lacon sanguineus* (Fleutiaux) **comb. n.** [Secondary junior homonym of *Lacon sanguineus* (Candèze, 1863.)]

LECTOTYPE (present designation) N. VIETNAM: ♀, Tonkin, Monts Mauson, Avril-Mai, 2-3000 H. Fruhstorfer; *Adelocera sanguinea* Fleut., type [Fleut] Bull Soc. Ent. Fr. 1908, p. 164 [Fleut.] (MNHN, Paris).

***Lacon mexicanus* (Candèze)**

*Adelocera mexicana* Candèze, 1857 : 70.

*Aulacon mexicanus* (Candèze) Arnett, 1969 (March) : 11.

*Lacon (Aulacon) mexicana* (Candèze); Golbach, 1969b (November) : 157.

Syntype examined. MEXICO: ♂, Mexique Gehin; Collection Chevrolat; *Mexicana* Cand., type [Fleut.]; *Adelocera mexicana* Chevr. Cand. Mon. 1. p. 70, 25, 1857 Mexico, D. Gehin, Coll. Chevrolat [Chevrolat] (MNHN, Paris).

Van Dyke (1943 : 44) records that he examined Candèze's type in the IRSNB, Brussels in 1932. This is presumably Candèze's second specimen which was submitted by Mniszech (not examined). Van Dyke was mistaken in his belief that *nobilis* Candèze (see p. 72) is a synonym of *mexicanus*.

***Lacon modestus* (Boisduval)**

*Elater modestus* Boisduval, 1835 : 108.

*Agrypnus nigroplagiatus* Blanchard, 1853 : 85; pl. 6, fig. 7. [Synonymized by Candèze, 1874 : 27.]

*Lacon modestus* (Boisduval) Fleutiaux, 1926 : 94.

*Lacon coomani* Fleutiaux, 1927 : 66.

*Lacon modestus* var. *coomani* Fleutiaux; Fleutiaux, 1947 : 275.

*Zalepia modesta* (Boisduval) Arnett, 1969 (May) : 11.

*Lacon* (*Zalepia*) *modesta* (Boisduval); Golbach, 1969 (November) : 159.

*Elater modestus* Boisduval. Lectotype (Van Zwaluwenburg, 1959 : 355). AUSTRALIA: ♀, Dej. N. Holl.; *Agrypn. modestus* Boisd. Dej. Cat. (e coll. Dejean) [Janson]; *Adelocera modesta* Boisd. Cand., type. Cdze [Janson] (BMNH).

Paralectotypes: 2 ♀, labels as lectotype but without the word 'type' on the determination labels (BMNH).

Boisduval based his description on an unrecorded number of specimens from 'Nouvelle Hollande' [Australia] in the Dejean collection (see p. 274). The absence of Boisduval's and/or Dejean's labels is probably due to Janson (see p. 276).

*Agrypnus nigroplagiatus* Blanchard. LECTOTYPE (present designation). BORNEO: ♀, Borneo, Bandjermassin, Jacquinet 1841: Museum Paris, *Agrypnus nigroplagiatus* [? Blanchard]; type de Blanchard [Fleut.]; *Adelocera modesta* Boisd. (MNHN, Paris).

*Lacon coomani* Fleutiaux. LECTOTYPE (present designation). N. VIETNAM: ♀, Hoa Binh. A. de Cooman; *Lacon coomani* Fleut., type [Fleut.] (MNHN, Paris).

Fleutiaux (1947 : 275) gives a useful review of the synonymy and biology of this species.

The description, distribution and size (5 [presumably German] lines, 12 mm) of *Agrypnus cribrus* Eschscholtz (1829 : 32) suggests that this species may be conspecific with *Lacon modestus* (Boisduval), the only member of the subfamily Agrypninae recorded from Hawaii (Sharp & Scott, 1908 : 368).

Eschscholtz based the description of *cribrus* on an unrecorded number of specimens from 'Sandwichii insulae' [Hawaii]. The type-material has not been located (for history of the Eschscholtz collection see p. 274). Candèze (1857 : 161) comments that *cribrus* resembles *Agrypnus caliginosus* Guérin but the distribution of this species appears to be restricted to Australia. *Agrypnus cribrus* Eschscholtz is not recorded in the Schenkling (1925) catalogue, or Fleutiaux's (1926) corrections thereto.

### ***Lacon monticola* (Candèze)**

*Adelocera monticola* Candèze, 1897 : 6.

*Lacon monticola* (Candèze) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). ♂, Himal. Coll. Jekel; *monticola* Cand., n.sp [Cand.]; *monticola* Cand., type. El. nouv. VI, p. 6 [Fleut.] (MNHN, Paris).

The published locality is 'Himalaya' without further details.

### ***Lacon nobilis* (Fall) comb. n.**

*Adelocera nobilis* Fall, 1932 : 58.

*Aulacon nobilis* (Fall) Arnett, 1969 : 11

LECTOTYPE (present designation). U.S.A.: ♀, Baboquiv. Mts. Ariz. 7/1-15/24; N.B.XII p. 137; Type nobilis [? Fall]; (MCZ, Harvard). Length: 20.5 mm.

Paralectotypes: 2 ♀, same locality and date as lectotype. 1 ♂, same locality, dated: 8/1-15/24 (MCZ, Harvard). None of the specimens bear determination labels.

Comparison of the lectotype of *nobilis* with the syntype of *mexicana* (Candèze) (see p. 71). has shown that Arnett's (1952 : 114) statement that these two species are distinct is fully justified.

### ***Lacon novus* Fleutiaux**

*Lacon novus* Fleutiaux, 1934e : 364.

LECTOTYPE (present designation). PHILIPPINES: ♂, Mt. Banahao, Luzon; *Lacon novus* Fleut., type ex *Adelocera* [Fleut.] (MNHN, Paris).

### ***Lacon obscurus* Fleutiaux**

*Lacon (Adelocera des Auteurs) obscurus* Fleutiaux, 1940a : 90.

LECTOTYPE (present designation). CHINA: ♂, Yunnan Sen, 1911; *Lacon (Adelocera) obscurus* Fleut., type [Fleut.] (MNHN, Paris).

### ***Lacon oliveri* (Candèze)**

*Adelocera oliveri* Candèze, 1874 : 20.

*Lacon oliveri* Schwarz, 1906 : 11 [Unjustified emendation.]

*Lacon oliveri* (Candèze) Fleutiaux, 1926 : 93.

Holotype. INDIA: ♀, Darjeeling, India; Janson coll. 1903.130; *Adelocera oliveri* (Janson), type [Janson] ms., Candèze [Gahan] (BMNH).

### ***Lacon olsoufieffi* Fleutiaux**

*Lacon olsoufieffi* Fleutiaux, 1932f : 450.

Holotype. ♂, MADAGASCAR: Madagascar, Perinet; *Lacon olsoufieffi* Fleut., type [Fleut.] (MNHN, Paris).

The specimen also bears a note in Fleutiaux's handwriting 'foveata Cand. comparé au type, Janv. 42'. The synonymy has not been published or confirmed.

### ***Lacon orientalis* (Fleutiaux)**

*Adelocera orientalis* Fleutiaux, 1918d : 185.

*Lacon orientalis* (Fleutiaux) Fleutiaux, 1926.

LECTOTYPE (present designation). NORTH VIETNAM: ♂, Chapa, Tonkin, Vitalis 28.5.16; *Adelocera orientalis* Fleut. Type [Fleut.] (MNHN, Paris).

Paralectotype: ♂, same locality as lectotype but dated Mai 1916 and without an identification label (MNHN, Paris).

### *Lacon palliatus* (Latreille)

*Elater palliatus* Latreille, 1809 : 230; pl. 16, fig. 3.

*Adelocera chapuisii* Candèze, 1857 : 66; pl. 1, fig. 5. [Synonymized by Candèze, 1874 : 29.]

*Lacon* (*Monocyrtus*) *palliata* (Latreille); Golbach, 1969b : 157.

The date of publication of *Elater palliatus* Latreille is usually recorded as 1811 : 145. This is the date on the title page of the re-issue of Humboldt and Bonpland's Voyage . . . etc. This work, and especially the 1809 edition, is very scarce and was probably unknown to many workers including Candèze (see below).

The present location of the material collected by Humboldt and Bonpland is unknown to me. I consider it reasonable to assume that Latreille retained at least one specimen of the new species he described and that this specimen is now in the BMNH collection (see below).

*Elater palliatus* Latreille. LECTOTYPE (present designation). MEXICO: ♂, Dej. Mexico; Janson coll. 1903.130; Ad. chapuisii Cdze, Cand., Type; Agrypn. palliatus Dej. Cat. (e coll. Dejean) e mus. Latreille; Adelocera palliata Latr. (*Elater palliatus* Latr.) [locality and all determination labels in Janson's handwriting] (BMNH).

The published locality is 'Trouvé parmi des gramineés pres de volcan de Jorillo, dans le Nouvelle Espagne' [Mexico]. The specimen agrees well with the figure, especially as regards the markings on the elytra. The absence of Latreille's determination label is probably due to Janson (see p. 276).

Janson's labels indicate that he believed this specimen to be the type of *A. chapuisii* Candèze. This cannot be the case as the colour pattern on the elytra does not agree with Candèze's figure.

*Adelocera chapuisii* Candèze. The description is based on an unrecorded number of specimens from Mexico submitted by de la Ferté Sénectère.

Type-material. There are no specimens in the BMNH determined by Candèze or from the de la Ferté Sénectère collections which agree with Candèze's figure. ?IRSNB, Brussels (see p. 271).

Candèze lists *Agrypnus palliatus* Dej. ed. 3. p. 99 as a synonym of *chapuisii*, though Dejean (1833 : 99) credits the species to Latreille and almost certainly had the type-material in his collection (see above and p. 277, Latreille collection). Candèze probably did not know of Latreille's work in which *palliatus* was described. I believe that he based his synonymy on the following specimen: ♂, Dej. Columbia [sic, Janson]; *Adelocera palliata* Latr. (*Elater palliatus* Latr); *A. chappuisii* Cdze, *Agrypnus palliatus* Dej. cat. (e coll Dejean) [both determination labels by Janson] in the BMNH. The markings of this specimen agree well with Candèze's figure. The markings of the elytra vary considerably within the species and I believe that the synonymy is fully justified.

***Lacon parallelus*** (Lewis)

*Adelocera parallela* Lewis, 1894 : 28.

*Lacon parallelus* (Lewis) Fleutiaux, 1926 : 93.

LECTOTYPE (Present designation). JAPAN: ♀, Sap. [underside of card mount]; Sapporo; Japan, G. Lewis, 1910 : 320; *Adelocera parallela* Lewis, type [Lewis] (BMNH).

***Lacon pectinatus*** (Candèze)

*Adelocera pectinata* Candèze, 1865 : 8.

*Lacon (Cornilacon) pectinata* (Candèze); Golbach, 1969b : 158.

Holotype. FRENCH GUIANA: ♂, Bar. Cayenne, Janson Coll. 1903 : 130; *Adelocera pectinata* Cdze, type (El. n.) (e coll. de Mniszech) [Janson] (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Lacon pectinicornis*** (Champion)

*Adelocera pectinicornis* Champion, 1894 : 262; pl. 10, figs 5, 5a, 5b.

*Lacon (Cornilacon) pectinicornis* (Champion); Golbach, 1969b : 158.

Holotype. NICARAGUA: ♂, Chontales, Nicaragua, T. Belt.; B.C.A. Col. III (1) *Adelocera pectinicornis* Ch. ♂ (Champ.); sp. figured (BMNH).

***Lacon pectoralis*** (Fairmaire)

*Adelocera pectoralis* Fairmaire, 1884b : 276.

*Lacon pectoralis* (Fairmaire) Fleutiaux, 1926 : 93.

The description is based on an unrecorded number of specimens from MADAGASCAR.

Type-material: not found in MNHN, Paris. ? IRSNB, Brussels (see p. 271).

The generic attribution based on Fairmaire's statement that the species resembles *inflata* Candèze (p. 67).

***Lacon philippinus*** (Fleutiaux)

*Lacon (Adelocera) philippinus* Fleutiaux, 1934c : 478.

Holotype. PHILIPPINES: ♀, Kabasalan, Zamboanga, Mindanao, P.1.39.32; H. C. Muzzal Collector, F. C. Haddon collection; *Lacon (Adelocera) philippinus* Fleut., Type [Fleut.] (MNHN, Paris).

Fleutiaux's use of (*Adelocera*) in this context is intended not as the name of a subgenus but to indicate that his interpretation of *Lacon* corresponds to *Adelocera* of other authors. See also Fleutiaux (1940a).

***Lacon pictus*** (Fleutiaux)

*Adelocera picta* Fleutiaux, 1902 (April) : 112.

*Lacon pictus* (Fleutiaux) Fleutiaux, 1926 : 93.

*Lacon (Monocyrton) picta* (Fleutiaux); Golbach, 1969b : 157.

LECTOTYPE (present designation). BRAZIL: ♂, Jatahy, Prov. Goyas, Brasil. Sept. à Nov. 97; *Adelocera picta* Fleut., type [Fleut.]; Bull. Soc. ent. Fr. 1902 p. 112 [Fleut.] (MNHN, Paris). Length: 13 mm.

Paralectotypes. 2 ♂, same locality as lectotype. Length: 13.6 mm and 12 mm. 1 ♀, 1 ♂, Jatahy, Goyas, Brasil (MNHN, Paris). Length: ♂, 9.5 mm, ♀ 16.8 mm.

Fleutiaux (1907a : 162) synonymizes *Anacantha bicostata* Schwarz (1902b (July) : 196) with this species. The synonymy has not been confirmed. Schwarz's description is based on an unrecorded number of specimens from Brazil, Prov. Goyas, Jatahy. Syntypes: ? DEI, Eberswalde.

### *Lacon pollinaria* (Candèze)

*Adelocera pollinaria* Candèze, 1857 : 68; pl. 1, fig. 14.

*Adelocera adspersa* Candèze, 1874 : 30. [Synonymized by Champion, 1894 : 260.]

*Lacon (Aulacon) pollinaria* (Candèze); Golbach, 1969b : 157. [Unjustified emendation.]

*Adelocera pollinaria* Candèze. LECTOTYPE (present designation). BRAZIL: ♀, Dej. Brasilia; Janson coll. 1903 : 130; *Adelocera pollinaria* (Dej.) Cdze, Cand., type (Janson); *Agrypnus pollinarius* Dej.Cat. (e coll. Dejean) [Janson] (BMNH).

*Adelocera adspersa* Candèze. Holotype. GUATEMALA: ♂, Guatemala, Sallé coll.; Isabal; *Adelocera adspersa* Cand. Salle coll. 1414; *A. aspersa* [sic] Cdze, type [Cand.]; *pollinaria* Cand. [Champ.]; sp. figured; B.C.A. Col. III (1) *Adelocera pollinaria* Cand. [Champ.] (BMNH).

### *Lacon punctatus* (Herbst)

*Elater punctatus* Herbst, 1779 : 316; pl. 7, fig. 1. [Synonymized with *atomarius* Fabricius by Panzer, 1801 : 1.]

*Elater carbonarius* Schrank, 1781 : 184. [Synonymized with *punctatus* Herbst by Herbst, 1784 : 110.]

*Elater pulverulentus* Panzer, 1795 : 235. [Synonymized with *atomarius* Fabricius by Panzer, 1801 : 1.]

*Elater atomarius* Fabricius, 1798 : 139.

*Adelocera punctatus* (Herbst) Seidlitz, 1888 : 168.

*Lacon punctatus* (Herbst) Fleutiaux, 1926 : 94.

*Elater punctatus* Herbst. Herbst appears to have based his description on material in his own collection (1779 : 315) which is now preserved in the MNHN, Berlin (not examined). Herbst does not record a locality but comments that *punctatus* is the largest of the 'einheimischen' [native, presumably German] Elaterids.

The figure clearly depicts the distinctive species standing as *punctatus* Herbst in all the collections known to me.

*Elater carbonarius* Schrank. The description is based on an unrecorded number of specimens from Vienna. The location of the Schrank collection or of the specimens on which he based his description is unknown. The description is sufficiently good to allow Herbst's synonymy to be accepted without reservation.

*Elater pulverulentus* Panzer. Panzer does not make it clear whether his description of *Elater pulverulentus* is based on specimens in his own or some other collection or on Herbst's figure of *Elater punctatus*. Panzer is known to have possessed a collection of insects (see obituary, 1829, *Flora, Jena* 12 : 400) which was probably sold by auction after his death. Unfortunately the fate of the Coleoptera collection is unknown. In the absence of any authentic material, Herbst's figure of *Elater punctatus* is here designated as the lectotype.

LECTOTYPE (present designation): Herbst, 1779 : pl. 7, fig. 1 depicting *Elater punctatus* Herbst, 1779 : 316.

Why Panzer did not use Herbst's name is unknown. Arnett (1953 : 6) suggests that the fact that Panzer refers only to Herbst's figure indicates that he believed that the figure and the description do not agree. Since Panzer does not refer to the description elsewhere and also refers only (1779 : 200 and 227) to Herbst's figures in the case of *Hispa atra* and *Buprestis berolinensis* I do not believe this to be the case. It seems more probable that Panzer merely wished to provide his readers with a reference to a good figure illustrating his description, and considered Herbst's description to be unimportant. One possible reason why Panzer substituted the name *pulverulentus* (powdery, dusty) for *punctatus* (spotted) is that he considered the former to be a more accurate description of the species than the latter. Another possibility is that he did so to avoid possible confusion.

Some time before the publication of the 'Taschenbuch' in 1795, Panzer (1793 : 118) used the name *Elater punctatus* in his translation of Voet (1781 or possibly earlier, see references p. 297). Panzer's annotations indicate that he considered *Elater punctatus* of Voet to be synonymous with *Elater bipustulatus* Linnaeus but he may have believed that the name used in Voet's attractive illustrated work would have a wider circulation and be more readily accepted than that published in Herbst's paper, which appeared in the journal of a learned society.

Whatever the reason for his action, six years later (1801 : 1) he placed *pulverulentus* Panzer, *carbonarius* Schrank and *punctatus* Herbst in synonymy with *Elater atomarius* Fabricius. The available evidence suggests that this synonymy is fully justified. Why Panzer gave preference to the Fabrician name is unknown. It may have been because he wished to express his high esteem for Fabricius (Panzer, 1795, Vorbericht). Herbst (1806 : 14) accepted the use of *atomarius* Fabricius in place of his own *punctatus* without comment.

*Elater atomarius* Fabricius. Fabricius credits this species to Linnaeus [1767] Syst. Nat. 2. 655.28 and Fn. Sv. [1761 : 208] 738. However as Panzer (1801 : 1) points out, Linnaeus did not describe a species with this name. Both references refer to *murinus* Linnaeus. Fabricius lists *E. pulverulentus* Panzer as a synonym and his comment 'Habitat in Germania. Dom Panzer' suggests that he may have based his description of *atomarius* on Panzer's *pulverulentus* specimens. Though it can never be proved conclusively that *pulverulentus* Panzer and *atomarius* Fabricius are objective synonyms, there seems no doubt that both authors were referring to the same species and that Panzer's synonymy can be accepted without reservation.

Why Fabricius listed the references to *murinus* under *atomarius* remains a mystery. He lists the same two references under *murinus* in the main body of the work (1792 : 221) though with a different, obviously erroneous, page number [22 instead of 28] for the 1767 publication. Why he re-named *pulverulentus* Panzer is also unknown. Arnett (1953 : 6) suggests that Fabricius did so because he was aware that *pulverulentus* Panzer was a homonym of *Elater pulverulentus* Herbst, 1786 [= *Chalcolepidius porcatus* (Linnaeus)]. This explanation is unacceptable as Fabricius does not refer to *E. pulverulentus* Herbst in any of his works and was probably unaware of its existence. A more probable explanation is that he had already named a specimen, and intended to publish the description of, *Elater pulverulentus* from 'America meridionali' in the Sehestedt collection. The description of this species, which does not appear in the Schenkling catalogue, was published in 1801 (see *L. laticollis* (Candèze) p. 68).

With the exception of a few workers who used the name *carbonarius* Schrank, the name *atomarius* Fabricius appears to have been generally accepted for this distinctive species until Seidlitz (1888 : 68) corrected the synonymy.

### ***Lacon pyrsolepis* (LeConte) comb. rev.**

*Adelocera pyrsolepis* LeConte, 1866 : 389.

*Lacon pyrsolepis* (LeConte) Fleutiaux, 1926 : 93.

*Diphyaulon pyrsolepis* (LeConte) Arnett, 1969 : 11.

Holotype. U.S.A.: ♂, N.M.; *Adelocera pyrsolepis* Lec. [Ulke] (CM, Pittsburgh, Ulke collection).

The published locality is New Mexico. The specimen agrees so well with the description that despite the absence of LeConte's determination label I have no hesitation in accepting it as the holotype.

### ***Lacon quadrinodatus* Lewis**

*Lacon quadrinodatus* Lewis, 1894 : 28.

*Lacon* (*Kobulacon*) *quadrinodatus* Lewis; Chûjô & Ohira, 1965 : 2.

Holotype. JAPAN: ♀, Yuyama Chio 1883 [sic, on underside of card mount]; Japan, G. Lewis 1910.320; Yuyama [sic]; *Lacon 4-nodatus* Lewis, type [Lewis]; G. *Lacon ex Adelocera* [? Fleut.] (BMNH).

The published locality is Oyayama.

### ***Lacon querceus* (Herbst) comb. rev.**

*Elater quercea* Herbst, 1784 : 113; pl. 27, fig. 11.

*Elater quercinus* Gmelin, 1890 : 1912. [Unjustified emendation.]

*Elater varius* Olivier, 1790: no. 31, p. 32; no. 31, pl. 3, fig. 26, pl. 7, fig. 68.

*Adelocera quercus* Seidlitz, 1872 : 110. [Unjustified emendation.]

*Adelocera querca* Reitter, 1911 : 213. [Unjustified emendation.]

*Lacon quercea* (Herbst) Fleutiaux, 1926 : 94.

*Zalepia quercea* (Herbst) Arnett, 1959 : 11.

*Elater quercea* Herbst. The description is based on an unrecorded number of specimens from Reppen [East Germany] and Hungary.

Type-material. Herbst's material is preserved in the NMHU, Berlin (not examined).

Examination of the material in the BMNH and the MNHN, Paris and other collections has shown that there is no difference of opinion concerning the identity of this species.

*Elater varius* Olivier. LECTOTYPE (present designation). FRANCE: sex undetermined, Museum Paris, Bosc 1828; varia Fab.; type de Olivier [Fleut.]; varia Fab. France (MNHN, Paris). The abdomen is missing.

The published locality is 'aux environs de Paris. Du Cabinet de M. Bosc.'

Olivier lists *Elater querceus* Fuesl. (=Herbst, 1784 in Fuesly) Archiv. ins. 5. pag. 113, tab. 27, fig. 11 as a synonym of *varius*. Why Olivier considered it necessary to rename Herbst's species is unknown.

Many authors, including Herbst (1806 : 36) himself and Candèze (1857 : 55), used the name *varius*, crediting it to Fabricius (1792 : 222) with *quercea* Herbst as a synonym. Fabricius (loc. cit.) credits the species to Olivier. Why so many nineteenth century workers did so remains a mystery. Perhaps it was to show the great esteem in which they held Fabricius.

### ***Lacon recticollis* Fleutiaux**

*Lacon recticollis* Fleutiaux, 1927 : 67.

LECTOTYPE (present designation). NORTH VIETNAM: ♂, Hoa Binh, Lac Tho, A. de Cooman; *Lacon recticollis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 2 ♀, 1 ♂, same locality labels as the lectotype but without Fleutiaux's determination labels (MNHN, Paris).

### ***Lacon robustus* (Fleutiaux)**

*Adelocera robusta* Fleutiaux, 1902b : 213.

*Lacon robustus* (Fleutiaux) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). HIMALAYA: ♀, Himalaya; *Adelocera robusta* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 2 ♀, same locality labels as the lectotype but without Fleutiaux's determination labels (MNHN, Paris).

The published locality is 'Himalaya' without further details. As there are no subsequent records of the species the country of origin remains unknown.

### ***Lacon rorulenta* (LeConte) comb. rev.**

*Adelocera rorulenta* LeConte, 1859b : 283.

*Lacon rorulenta* (LeConte) Fleutiaux, 1926 : 93.

*Diphyaulon rorulenta* (LeConte) Arnett, 1969 : 11.

Holotype. U.S.A.: ♀, blue paper disk [=Washington, see p. 277]; *A. rorulenta* LeC., *aurorata* LeC. [LeC.]; Type 2375 (MCZ, Harvard).

The published locality is Steilacoom [Washington]. The inclusion of the name *aurorata* LeC. on the determination label presumably refers to LeConte's (1857 : 18) misidentification of the species.

### ***Lacon ruber* (Perty)**

*Elatev ruber* Perty, 1830 : 20; pl. 5, fig. 1.

*Lacon (Monocyrtus) rubra* [sic] (Perty); Golbach, 1969b : 157.

The description is based on an unrecorded number of specimens collected near S. Paulo, BRAZIL by Spix and Martius.

Type-material: Spix and Martius material in ZSBS, Munich according to Horn & Kahle (1936 : 208). Not confirmed.

The generic attribution is based on the following specimen: ♂, Fry. Rio Jan°; *Adelocera rubra* Perty, *brasiliensis* Cast., Brasilia [Fry] (BMNH).

This is the species generally known as *rubra*. This erroneous spelling was first used by Candèze (1857 : 67).

Germar (1840) placed *Adelocera brasiliensis* Castelnau (1836 : 14), described from an unrecorded number of specimens from Brazil, in synonymy with *ruber*. As the type material (?NMV, Melbourne or IRSNB, Brussels) has not been located the synonymy has not been confirmed.

### ***Lacon rubidus* (Schwarz)**

*Adelocera rubida* Schwarz, 1902b : 195.

*Lacon (Aulacon) rubida* (Schwarz); Golbach, 1969 : 157.

The description is based on an unrecorded number of specimens from Insula Mona [PUERTO RICO].

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the description.

### ***Lacon rubripennis* Fleutiaux**

*Lacon (Adelocera des Auteurs) rubripennis* Fleutiaux, 1940a : 89.

LECTOTYPE (present designation). CHINA: ♀, Tali [sic], Haut Yunnan; *Lacon rubripennis* Fleut., type (*Adelocera*) [Fleut] (MNHN, Paris).

The published locality is Toli.

### ***Lacon sachalinensis* (Miwa) comb. n.**

*Adelocera sachalinensis* Miwa, 1927 : 13; pl. 1, fig. 1.

Holotype. ?CHINA: Saghalien, collected by S. Issiki at Nairo, Aug. 10, 1914.

The location of type not recorded. ?Taiwan Agricultural Research Institute, Taipei.

The generic attribution is based on the description and figure.

***Lacon salvazai* (Fleutiaux)**

*Adelocera salvazai* Fleutiaux, 1918d : 184.

*Lacon salvazai* (Fleutiaux) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Laos, Xieng Khouang, 20.[?]13.15, V. de Salvaza; *Adelocera salvazai* Fleutiaux, Type [Fleut.] (MNHN, Paris).

***Lacon sanguineus* (Candèze) comb. n.**

*Scelisus sanguineus* Candèze, 1863 : 327; pl. 5, fig. 1.

Holotype. ♀, India or.; Janson coll. 1903.130; *Scelisus sanguineus* Cdz. type [Cand.]; *Scelisus sanguineus* Cand. [Janson] (BMNH).

The published locality is 'Hindoustan septentrional'. As the term 'Hindoustan' was used for both the whole of India and also for a more restricted region north of the Vindhya mountains, the locality remains uncertain. There are no additional records of this species. The discrepancy between the published locality and the label probably arose when Janson relabelled the specimens.

The characteristics of this species, the type-species of *Scelisus*, are discussed on p. 54.

***Lacon setosus* (Candèze)**

*Adelocera setosa* Candèze, 1874 : 29.

*Lacon (Aulacon) setosa* (Candèze); Golbach, 1969b : 158.

LECTOTYPE (present designation). BRAZIL: ♂, Villanova, Bates coll.; Janson coll. 1903 : 130; *Adelocera setosa mihi* [Janson, 'mihi' is crossed out] Candèze, type [Gahan] (BMNH).

The absence of Candèze's label is probably due to Janson (see p. 276). The published locality is Villa Nova de Rainha.

***Lacon sparsus* (Candèze) comb. rev.**

*Adelocera sparsa* Candèze, 1865 : 6.

*Lacon sparsus* (Candèze) Fleutiaux, 1926 : 93.

*Diphyaulon sparsus* (Candèze) Arnett, 1969 : 11.

LECTOTYPE (present designation). U.S.A.: ♂, *Adelocera sparsa* n. sp. Cdz. Californie, Sacramento, Schaum [Cand.]; Janson coll., ex Candèze; Lectotype *Adelocera sparsa* Cand. [M. C. Lane, 1964] (BMNH).

The specimen also bears M. C. Lane's label; Lectotype, *Adelocera sparsa* Cand. This lectotype designation does not appear to have been published.

The material from the Dohrn collection recorded by Candèze, if it survived the war, should be in the IZPAN, Warsaw (see p. 274).

***Lacon spurcus* (Candèze) comb. rev.**

*Adelocera spurca* Candèze, 1874 : 25.

*Lacon spurcus* (Candèze) Fleutiaux, 1926 : 93.

*Sulcilacon spurcus* (Candèze) Fleutiaux, 1941c : 48.

LECTOTYPE (present designation). LAOS: ♂, Laos; Mouhot, Janson coll. 1903 : 130; *A. spurca* Cdz. type [Cand.]; *Adelocera spurca* Cand. Laos (Mouhot) [Gahan] (BMNH).

Paralectotype: ♀, Laos, Mouhot; Janson coll. 1903 : 130; *A. spurca* Cdz. type [Cand.] (BMNH).

The material in the Saunders collection recorded by Candèze has not been traced (see p. 279).

***Lacon strangulatus* (Fleutiaux)**

*Adelocera strangulata* Fleutiaux, 1906a : 199.

*Lacon strangulatus* (Fleutiaux) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). MADAGASCAR: ♀, Amber Geb.; *strangulata* Fleut., type, Region Diego Suarez [Fleut.]; Bull. Soc. ent. Fr. 1906, p. 199 [Fleut.] (MNHN, Paris).

***Lacon subcostatus* (Candèze)**

*Adelocera subcostata* Candèze, 1857 : 69.

*Adelocera subcostata* var. *a* Candèze, 1857 : 69.

*Adelocera subcostata* vhr. *a. albicans* Chevrolat, 1867 : 596.

*Lepidelater misticius* Mignot, 1969 [March] : 12. **Syn. n.**

*Lacon (Aulacon) subcostata* (Candèze); Golbach, 1969b [November] : 159.

*Adelocera subcostata* Candèze. LECTOTYPE (present designation). LESSER ANTILLES, GUADELOUPE: ♀, Collection Chevrolat; *subcostata* Cand. type [Fleut.]; *A. subcostata* Chevr. Ann. Soc. Ent. Fr. 1867, p. 596 [Fleut.]; Fleut., Ann. Fr. 1911, p. 246 [Fleut.]; *Adelocera subcostata* Cand. Mon. 1, 1857, p. 69, 24. Guadeloupe, Pointe à Pitre. L. Leherminier [Chevrolat, green label. The words 'Cuba P. Poey' also appear squeezed in among the other words. They may have been added later] (MNHN, Paris).

Candèze states that he retained the name under which Chevrolat submitted the specimens. Chevrolat (1867 : 596) records that he had two 'types'. The second specimen has not been located.

*Adelocera subcosta* var. *a*. Candèze. LECTOTYPE (present designation). CUBA: ♀, Cuba, Collection Chevrolat; *subcosta* v. *a. (albicans)* Chevr. type [Fleut.] (MNHN, Paris).

*Lepidelater misticius* Mignot. Holotype. VIRGIN ISLANDS: ♂, St John,

November 15, 1966 (in insect trap). USDA. lot 66.2777 (USNM, Washington). Not examined.

Paratypes examined: 1 ♂, Isla Verde, Puerto Rico, 9.20.1968; in light trap. V. L. Blackburn 68.24700; Paratype *Lepideler misticius* Mignot 1 ♂, St John, Virgin Is; G. Tallia, 8.17.67, 67.22778; Paratype, *Lepideler misticius* Mignot [aedeagus missing] (USNM, Washington). The location of the remaining 3 ♂ and 1 ♀ paratypes are unknown to me.

Mignot states that there is no evident secondary sexual dimorphism. In the BMNH series of specimens the antennae of the males exceed the length of the antennal groove by two segments, while in the female the last segment of the antenna barely attains the end of the groove.

***Lacon subjectinatus* (Schwarz) comb. rev.**

*Alaotypus subjectinatus* Schwarz, 1902f : 308.

*Adelocera denticornis* Fleutiaux, 1906b : 212. [Synonymized by Fleutiaux, 1918d : 186.]

*Lacon subjectinatus* (Schwarz) Fleutiaux, 1926 : 93.

*Alaotypus subjectinatus* (Schwarz); Fleutiaux, 1927 : 62.

*Alaotypus subjectinatus* Schwarz: the description is based on two specimens from N. VIETNAM: Tonkin, Montes Mauson (Fruhstorfer).

Syntypes: ? DEI, Eberwalde.

*Adelocera denticornis* Fleutiaux. LECTOTYPE (present designation). NORTH VIETNAM: ♂, Tonkin Montes Mauson, Avril-Mai, 2-300, H. Fruhstorfer; *Adelocera denticornis* Fleut., type [Fleut.]; Bull. Soc. Ent. Fr. 1906, p. 212 [Fleut.] (MNHN, Paris).

Paralectotypes: 1 ♀, 2 ♂, same locality labels as the lectotype, but without Fleutiaux's determination labels (MNHN, Paris).

As the descriptions agree and both species are based on material from the same locality, it seems reasonable to accept Fleutiaux's synonymy.

***Lacon tenebrionoides* (Candèze)**

*Adelocera tenebrionoides* Candèze, 1857 : 61.

*Adelocera tenebrionoides* Candèze, 1874 : 22. [Unjustified emendation.]

LECTOTYPE (present designation). MADAGASCAR: ♀, Laf. Madagascar; Janson coll. 1903 : 130; *Adelocera tenebrionoides* Cdze, Cand., type (e coll. Laferte [Janson]; n. sp. Madagascar (BMNH).

The material from the Deyrolle collection recorded by Candèze has not been traced.

***Lacon tonkinensis* (Fleutiaux) comb. n.**

*Alaotypus tonkinensis* Fleutiaux, 1927 : 62; pl. 2, fig. 39.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Tonkin Chapa.

Mai 1916. Vitalis de Salvaza; *Adelocera tonkinensis* Fleut., type [Fleut.]; type de la fig. (MNHN, Paris).

Paralectotype: 1 ex., Tonkin, Chapa. 4.v.1918. Jeanvoine, without Fleutiaux's determination label (MNHN, Paris).

***Lacon tumulosus* (Candèze)**

*Adelocera tumulosa* Candèze, 1888 : 668.

*Lacon tumulosus* (Candèze) Fleutiaux, 1926 : 93.

Holotype. BURMA: Plapoo, Tenasserim, aprile 1887, legit L. Fea. (MCZN, Genoa, according to Binaghi, 1941c : 120.) Not confirmed.

The generic attribution is based on the description.

***Lacon unicolor* (Candèze)**

*Adelocera unicolor* Candèze, 1874 : 21.

*Lacon unicolor* (Candèze) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). IRAN: ♀, Persia; unicolor Cdz. [Cand.]; *Adelocera unicolor* Cand., type [Gahan] (BMNH).

***Lacon vicinus* Candèze**

*Adelocera vicina* Candèze, 1891c : 772.

*Lacon vicinus* (Candèze) Binaghi, 1941c : 119.

The description is based on two specimens from BURMA: Palon (Pégou) collected ix.1888 by Fea.

Type-material. BURMA: 1 ♂, Palon (Pegu) agosto-settembre 1877 [sic], legit L. Fea (MCSN, Genoa according to Binaghi, 1941c : 120). Binaghi refers to this specimen as the holotype but as the description is based on two specimens it must be regarded as a syntype until a lectotype has been designated. The second specimen may also be in the MCSN, Genoa or in the IRSNB, Brussels.

Candèze remarks that this species is probably a variety or subspecies of *A. modesta* [Boisduval]. Fleutiaux (1926 : 93) lists it as a synonym of *Lacon modestus* (Boisduval), but Binaghi considers that it should be treated as a valid species.

The generic attribution is based on Binaghi's redescription of the syntype.

***Lacon viettei* Girard**

*Lacon viettei* Girard, 1970 : 25.

Holotype. MADAGASCAR: ♂, massif du Tsaratanana (versant sud), Andohananahila, 1,850 m, III. 1967 (*P. Soga*) (MNHN, Paris).

Paratype: same data as holotype (Girard collection, Laboratoire de Zoologie, Ecole normale supérieure, Paris).

Both specimens bear Girard's determination labels.

***Lacon viridis* (Champion)**

*Adelocera viridis* Champion, 1894 : 260; pl. 11, fig. 3.

*Lacon* (*Cornilacon*) *viridis* (Champion); Golbach, 1969b : 158.

Holotype. MEXICO: ♀, Omitterne, Guerrero, 8,000 ft. Aug. H. H. Smith; B.C.A. Col. III (1); *Adelocera viridis* Ch. [Champ.]; sp. figured (BMNH).

***Lacon vitalisi* (Fleutiaux)**

*Adelocera vitalisi* Fleutiaux, 1918d : 184.

*Lacon vitalisi* (Fleutiaux) Fleutiaux, 1926 : 93.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Laos, Xieng Khouang 22.3.1915. R. V. de Salvaza; *Adelocera vitalisi* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype: ♀, Xieng Khouang 23.12.15, Vitalis de Salvaza (MNHN, Paris).

***Lacon wallacei* (Candèze)**

*Adelocera wallacei* Candèze, 1874 : 26.

*Lacon wallacei* (Candèze) Fleutiaux, 1926 : 93.

Holotype. BORNEO: ♀, Sar. 1363; Janson coll. 1903.130; *Adelocera wallacei* (Janson) type [Janson] ms., Candèze [Gahan] (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Lacon yunnanus* Fleutiaux**

*Lacon* (*Adelocera* des auteurs) *yunnanus* Fleutiaux, 1940a : 90.

LECTOTYPE (present designation). CHINA: ♀, Kouang Si Hien, alt. 2109 m. Sud Est Yunnan; *Lacon* (*Adelocera*) *yunnanus* Fleut. [Fleut.] (MNHN, Paris).

**CANDANIUS nom. n.**

*Anius* Candèze, 1889 : 103. Type-species: *Anius gracillimus* Candèze, by monotypy.

*Anius* Candèze, 1889 is a junior homonym of *Anius* Pascoe, 1885 (Coleoptera, Curculionidae). *Candanius* is here proposed as a replacement name for *Anius* Candèze nec Pascoe.

GENERIC DIAGNOSIS. As for *Lacon*. The difference between the two genera is that in *Candanius* the posterior prosternal process is turned upwards immediately behind the anterior coxae. This characteristic is not generally of any importance at the generic level within the Agyrpninae and further studies may show that there is no justification for the retention of *Candanius* as a separate genus (see also below).

***Candanius gracillimus* (Candèze) comb. n.**

*Anius gracillimus* Candèze, 1889 : 103.

The description is based on an unrecorded number of specimens from Chile submitted by Fairmaire. Fleutiaux (1907 : 170) described the three specimens in the Candèze collection in the IRSNB, Brussels in some detail. He tentatively, but correctly, identified them as two males and one female but expressed some doubt that they belonged to the same species. I believe that they may be conspecific. As Fleutiaux remarks, it is impossible to tell which specimen formed the basis of Candèze's description. For the present I consider that all three specimens should be treated as syntypes and they have been labelled to this effect.

Syntypes examined. CHILE: ♀, *Anius* n.g. *gracillimus* Cand. Chile [?Fairm.]; ex coll. Fairmaire; Collection E. Candèze; *Anius gracillimus* Cand. ♀? Fleutiaux det. 1903 [Fleut.]; *Anius gracillimus* Cd. det. E. Candèze [IRSNB curatorial label]. 1 ♂, Quillota; Collection E. Candèze; G.n. *Anius* Cdz. [Cand., green border]; n. sp. *gracillimus* Cdz., Chile, Frm. [Cand., green border]; *Anius gracillimus* Cd. det. E. Candèze [IRSNB curatorial label]. 1 ♂, Quillota; Collection E. Candèze; *Anius gracillimus* Cand. ?♂, Fleutiaux det. 1903 [Fleut.]; Chile, ex coll. Fairmaire; *Anius gracillimus* Cd. det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

Candèze placed *Anius* in the sub-tribe Pomachilites near *Psilonicus*. However all three specimens differ from *Psilonicus* and its allies in that tibial spurs are absent, the claws bear setae at the base and the prosternopleural suture is grooved for a greater (♀, groove occupies about half the length of the suture) or lesser (♂, groove occupies slightly less than one third of the length of the suture) part of its length for the accommodation of the antennae. I believe that the presence of these characters fully justifies the inclusion of *gracillimus* in the Agrypninae. Fleutiaux (1907 : 170) was of the same opinion as he considered that the genus should be placed near *Adelocera* [sensu auct. nec Latreille, = *Lacon* Castelnau of the present work].

In general appearance and the possession of short antennal grooves *C. gracillimus* bears a distinct resemblance to the chilean *Dilobitarsus vitticollis* (Fairmaire and Germain) and *D. crux* (Philippi). It differs from these species in that there are no lobes on the tarsi. It is of interest that *C. gracillimus* resembles *D. vitticollis* and *crux* in that the prothorax of the female is much more strongly convex than that of the male and I consider that this lends support to my belief that the syntype specimens are conspecific. It must be admitted that in no other species known to me does the length of the antennal groove of the female differ from that of the male. Fleutiaux's (1907 : 167) comment that this difference occurs in *vitticollis* is based on the erroneous synonymy of *D. vitticollis* and *D. crux*.

For the present the genus *Candanius* is retained as a separate entity. Study of additional material, when it becomes available, may show that (as in the case of *Agrypnus*) the structure of the tarsi and the length and depth of the groove for the accommodation of the antennae are not characters of sufficient importance to justify the retention of *Dilobitarsus*, *Lacon* and *Candanius* as separate genera.

**DANOSOMA Thomson gen. rev.**

*Danosoma* Thomson, 1859 : 103. Type-species: *Elater conspersus* Gyllenhal, by monotypy.

*Delox* Quelle, 1932 : 208 [as a subgenus of *Adelocera* sensu auct., nec Latreille]. Type-species:

*Elater conspersa* Gyllenhal, by subsequent designation (Arnett, 1955 : 607).

GENERIC DIAGNOSIS. Tarsal claws without a group of setae at the base (Text-fig. 12). Tibial spurs absent (Text-fig. 10). Mesepisternum does not form part of the margin of the mesocoxal cavity; mesepimeron forms part of margin of mesocoxal cavity (Text-fig. 3). Second antennal segment moniliform, third weakly triangular, each almost equal in length to the fourth and following segments. Antennal grooves long, extending almost the entire length of the prosternopleural suture and deep enough to accommodate the antennae. Body clothed with narrow scales. Prothorax simple, without constriction behind the anterior angles; lateral carina present. Propleurae and metasternum without well-defined grooves for the accommodation of the tarsi of the anterior and middle legs. Scutellum simple, without carina. Tarsi simple, without ventral lobes (Text-fig. 15).

RANGE OF VARIATION FOUND WITHIN THE GENUS. The four species included in the genus bear a close resemblance to one another and also to certain *Lacon* species from which they are easily distinguished by the absence of setae at the base of the claws. The curious similarities between certain palaearctic and holarctic species are discussed in the section on the distribution of the species.

HISTORY OF THE GENUS. Thomson established *Danosoma* for a single species, *conspersa* Gyllenhal, in which the antennal grooves are long enough to accommodate the antennae and the base of the prothorax is narrower than the base of the elytra. In addition the posterior angles of the prothorax are bicarinate and not turned outward at the apex. Seidlitz (1888 : 169) reduced *Danosoma* to a subgenus of *Adelocera* (sensu auct. nec Latreille = *Lacon* Castelnau of the present work). The subgenus was not generally accepted and Arnett (1953 : 7) treated *Danosoma* as a subjective synonym of *Lacon* Castelnau.

Quelle was aware of the existence of *Danosoma* but nevertheless established *Delox* as a subgenus of *Adelocera* (sensu auctt., nec Latreille) for four species, including *conspersa* Gyllenhal, which lacked setae at the base of the claws. Arnett (1955 : 607) designated *conspersa* as the type-species of *Delox*, thereby making *Danosoma* and *Delox* isogenotypic.

I consider the absence of the setae at the base of the claws to be of sufficient importance to warrant the establishment of a genus. The genus *Danosoma* is here redefined on this basis.

SEXUAL DIMORPHISM. The species included in this genus do not appear to display any marked sexual dimorphism.

DISTRIBUTION. Northern Palaearctic and northern Holarctic regions. Two species occur in each region. There is a close resemblance, both in general appearance and in the shape of the aedeagus, between the palaearctic *conspersa* and the holarctic *brevicornis* and the palaearctic *fasciata* and the holarctic *obtectus*.

Quelle (1932 : 209) drew attention to the similarities between *conspersa* and *brevicornis* and *fasciata* and his interpretation of *profusa*. Quelle misinterpreted *profusa*, believing that the posterior angles of the prothorax were simple, whereas

those of the type are laterally compressed. Quelle's *profusa* [not examined] is probably *obtectus* Say.

BIOLOGY AND HABITS. The larvae of *D. fasciata* (Linnaeus) has been described by Perris (1876 : 169). The larvae are predaceous and live in wood, probably in the galleries of wood-boring insects (Kirk, 1933).

#### SPECIES INCLUDED IN THE GENUS

Four species are at present assigned to the genus. Three of these were included in *Delox* by Quelle. The fourth, *obtectus* Say, is probably the species which was known to Quelle as *profusa*.

#### *Danosoma brevicornis* (LeConte) **comb. n.**

*Adelocera brevicornis* LeConte, 1853 : 491.

*Adelocera profusa* Candèze, 1857 : 54. [Synonymized by Arnett, 1952 : 115.]

*Adelocera vetusta* Walker, 1866 : 324. [Synonymized with *profusa* by Candèze, 1891c : 13.]

*Adelocera* (*Delox*) *brevicornis* (LeConte); Quelle, 1932 : 208.

*Lepidotus* (*Danosoma*) *brevicornis* (LeConte) Arnett, 1952 : 115.

*Lacon* (*Lacon*) *brevicornis* (LeConte); Arnett, 1953 : 7.

*Adelocera brevicornis* LeConte. LECTOTYPE (present designation). U.S.A.: ♀, light blue-grey paper disk [=Lake Superior, see p. 277]; Type 2377 [MCZ curatorial label]; Ad. *brevicornis* LeC. Lac. Sup. [LeConte] (MCZ, Harvard).

Paratypes: 1 ♂, 2 ♀, all with light blue-grey paper disks and labelled 'brevicornis 4, 3 and 2 respectively (MCZ, Harvard).

*Adelocera profusa* Candèze. Holotype. U.S.A.: ♂, Laf. Oregon; Janson coll. 1903.130; Oregon. Coll. Reiche; A. *profusus* Cdz., type [Cand.]; Holotype *Adelocera profusa* Cand. M. C. Lane 1964 [M. C. Lane]; *Adelocera profusa* Cdze, Cand. type (ex coll. de Laferté) [Janson] (BMNH).

*Adelocera vetusta* Walker. LECTOTYPE (present designation). CANADA: ♂, Brit. Colum./64.18 [BMNH registration number = presented by J. K. Lord]; *vetusta* [Walker]; *Adelocera vetusta* Walker, Brit. Columbia (J. K. Lord) [Gahan]; holotype *Adelocera vetusta* Walk., M. C. Lane 1964 [Lane] (BMNH).

Candèze (1891c : 13) lists *Adelocera cavicollis* LeConte, 1859 : 86 as a synonym. The description is based on a single specimen found on the shores of Tlamath Lake [? Upper Kalmath Lake, Oregon, Arnett, 1952 : 115] by Dr Newberry. Arnett (1952 : 115) states that this specimen is not in the LeConte collection. I have been unable to trace Dr Newberry's collection.

Arnett (1952 : 115) believes that *operculatus* Say, 1836, nomen nudum, may belong to this species.

#### *Danosoma conspersa* (Gyllenhal) **comb. rev.**

*Elatér conspersa* Gyllenhal, 1808 : 377.

*Danosoma conspersa* (Gyllenhal) Thomson, 1859 : 103.

*Adelocera (Delox) conspersa* (Gyllenhal); Quelle, 1932 : 208.

*Lepidotus (Danosoma) conspersa* (Gyllenhal) Arnett, 1952 : 115.

*Lacon (Lacon) conspersa* (Gyllenhal); Arnett, 1953 : 7.

The description is based on an unrecorded number of specimens from SWEDEN.

Type-material: ? ZUM, Uppsala.

The generic attribution is based on the examination of specimens identified as *conspersa* in the BMNH and MNHN, Paris.

Tscherepanov (1957 : 190) includes *conspersa* in *Adelocera*. This is probably due to the fact that he was unaware of Fleutiaux's (1926) correction to the Schenkling Catalogue in which the species is transferred to *Lacon*.

### ***Danosoma fasciata* (Linnaeus) comb. n.**

*Elater fasciatus* Linnaeus, 1758 : 406.

*Adelocera angustata* Sahlberg, 1903 : 25. [Junior primary homonym of *Adelocera angustata* Philippi, 1861. See p. 100.]

*Adelocera sahlbergi* Schwarz, 1907 : 315. [Replacement name for *Adelocera angustata* Sahlberg.

Synonymized by Tscherepanov, 1957 : 187.]

*Adelocera (Delox) fasciata* (Linnaeus); Quelle, 1932 : 208.

*Elater fasciatus* Linnaeus. LECTOTYPE (present designation): 18, fasciatus [Linnaeus] (BMNH, Linnaean coll.).

Paralectotypes: 1 ex., 27 [printed]. 1 ex., 95 [MSS.] (BMNH, Linnaean coll.).

*Adelocera angustata* Sahlberg. LECTOTYPE (present designation). U.S.S.R.: ♂, Jeniseisk [sic]; J. Sahlb., spec. type; *Adelocera angustata* J. Sahlb. [Sahlb.] (TU, Finland).

Paralectotypes: 1 ♂, Jeniseisk, Kitmanoff [sic] (TU, Finland). 1 ♂, 392 [museum catalogue number = River Ob, between Narym and the mouth of the R. Tschulin, 1-2 June]; Mus. Zool. H.fors. spec. type No. 1222, *Adelocera angustata* J. Sahlberg; *A. angustata* [?Sahlb]. The specimen also bears two labels, 'Krasnojask' and 'Stalloff' which are believed to have been affixed in error (ZMU, Helsinki).

The published localities of *angustata* are: Habitat in Siberia. Prope oppidum Timsk ad flumen Obi d. 1 Juni a Dom Trybom detecta; deinde prope oppidum Jenisseisk d. 14 juni nonnulla specimina ipse inveni; postea etiam a Dom. Kipmanov e vicinitate oppidi Jenisseisk missa.

Timsk is probably Tysk or Ust'Tym (59°29'N., 80°03'E.) on the River Ob about 300 km N.W. of the confluence of the Ob and Tschulin [Chulyum] rivers. Narym (59°00'N., 81°30'E.) is also on the River Ob about 200 km N.W. of the confluence of the Ob and Tschulin. Despite the discrepancy between the published locality and that on the specimen I believe that it formed part of Sahlberg's original series.

### ***Danosoma obtecta* (Say) comb. n.**

*Elater obtectus* Say, 1839 : 181.

*Lepidotus (Danosoma) obtectus* (Say) Arnett, 1953 : 7.

*Lacon (Lacon) obtectus* (Say); Arnett, 1969 : 11.

The description is based on an unrecorded number of specimens from MASSACHUSETTS submitted by Dr Harris.

Type-material: not found in the ANS, Philadelphia, see note on the Say collection, p. 279. There are no specimens of this species in the Harris collection in the MCZ, Harvard. The type-material must therefore be regarded as lost.

The generic attribution is based on the following specimen standing as *obtecta* Say in the BMNH: ♂, Buffalo, N.Y.; Andreas Bolter Collection.

The description of this species may have appeared before 1839, see note in the bibliography, p. 295.

### ***EIDOLUS* Candèze**

*Eidolus* Candèze, 1857 : 178. Type-species: *Eidolus linearis* Candèze, by monotypy.

GENERIC DIAGNOSIS. Each claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum does not form part of margin of the mesocoxal cavity; mesepimeron forms part of margin of the mesocoxal cavity (Text-fig. 3). Third antennal segment larger than the second, similar in shape to the fourth. Segments three to eleven pectinate. Antennal grooves shallow, occupying the anterior three-quarters of the prosternopleural suture. Body clothed with narrow scales. Prothorax without constriction behind the anterior angles; lateral carina absent. Propleurae and metasternum without grooves or depressions for the accommodation of the anterior and middle tarsi. Scutellum simple, without carina. Tarsi simple, without ventral lobes.

HISTORY OF THE GENUS. The genus was established for a single species with pectinate antennae in which the lateral margin of the prothorax is not carinate.

SEXUAL DIMORPHISM. Unknown. The two lectotypes are the only specimens known to me.

DISTRIBUTION. Brazil.

LIFE HISTORY AND HABITS. Nothing is known of the life history and habits of the two species included in the genus.

### SPECIES INCLUDED IN THE GENUS

Only two species are attributed to the genus.

### ***Eidolus gratiosa* (Fleutiaux) comb. n.**

*Adelocera gratiosa* Fleutiaux, 1902b : 213.

*Lacon* (*Cornilacon*) *gratiosa* (Fleutiaux); Golbach, 1969b : 188.

LECTOTYPE (present designation). BRAZIL: ♀, Jatahay, Goyas, Brazil; *Adelocera gratiosa* Fleut. type Bull. Soc. Ent. Fr. 1902, p. 213 [Fleut.] (MNHN, Paris).

### ***Eidolus linearis* Candèze**

*Eidolus linearis* Candèze, 1857 : 179; pl. 3, fig. 1.

LECTOTYPE (present designation). BRAZIL: ♂, Braz. mer.; Janson coll.

1903.130; *Eidolus linearis* Cdze, type. [Janson] ex coll. Laferte [Gahan]; *Hem. agrestis* Buq. in mus. e coll. de Laferte [Janson] (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276). The second syntype, from the Deyrolle collection, has not been located.

### **OPATELUS** Candèze

*Opotelus* Candèze, 1857 : 86. Type-species: *Opotelus limbatus* Candèze, by subsequent designation (Hyslop, 1921 : 660).

GENERIC DIAGNOSIS. Each claw bearing a group of setae near the base (Text-fig. 11) Tibial spurs absent. Mesepisternum, does not form part of the margin of the mesocoxal cavity; mesepimeron forms part of the margin of the mesocoxal cavity (Text-fig. 3). Second and third antennal segments subequal, each smaller than the fourth and following segments. Antennal groove long, extending almost the entire length of the prosternopleural suture. The distance separating the posterior end of the groove from the anterior coxae is equal to the width of the groove. The groove is deep enough to accommodate the rolled antennae. Body clothed with narrow scales. Prothorax simple, without constriction behind anterior angles; lateral carinae present. Propleurae and metasternum with well defined grooves for the reception of the tarsi of the anterior and middle legs. Propleural grooves parallel to antennal grooves; metasternal grooves curved, running diagonally across the sternite, the posterior ends, if produced, would cut the posterior margin of the metasternum near the posterior lateral angles (Text-fig. 4). Scutellum simple, without carina. Fourth tarsal segment with a ventral lobe (Text-fig. 16).

HISTORY OF THE GENUS. This distinctive and easily recognized genus was established for the four species which are still assigned to it.

Candèze's generic diagnosis, which except for the first three characters listed, agrees remarkably well with that given above, defines the genus so accurately that it is very surprising that he subsequently assigned *argentatus* (see *Lacon argentatus* (Candèze), p. 56) to the genus.

SEXUAL DIMORPHISM. The sexes are not distinguishable on external characteristics.

DISTRIBUTION. Brazil, Bolivia.

BIOLOGY AND HABITS. Nothing is known of the habits or life-history of the four species included in the genus.

### SPECIES INCLUDED IN THE GENUS

Schenkling (1925 : 20) records five species in this genus. The generic attribution of three species is confirmed by examination of the type-material and a fourth provisionally placed on information available from the description. The fifth, *argentatus* Candèze is transferred to *Lacon* (see p. 56).

### *Opotelus cribratus* (Blanchard)

*Lacon cribratus* Blanchard, 1845 : 145.

*Opotelus cribratus* (Blanchard) Candèze, 1857 : 88.

LECTOTYPE (present designation). BOLIVIA: ♀, Museum Paris, Bolivie

(Chiquitos) D'Orbigny, 1834; *L. cribratus* Blanch., Chiquitos, Mr. d'Orbigny; *Lacon cribratus* E. Blanch., type Fleutiaux det. [Fleut.] (MNHN, Paris).

The date of publication of this species, which is generally recorded as 1837-43, was obtained from Sherborn and Griffin (1934).

### *Opatelus fasciatus* Candèze

*Opatelus fasciatus* Candèze, 1857 : 89.

The description is based on a unique specimen from Brazil submitted by Boheman.

Holotype: ? NR, Stockholm.

The generic attribution is based on the description.

### *Opatelus limbatus* Candèze

*Opatelus limbatus* Candèze, 1857 : 87; pl. 3, fig. 2.

LECTOTYPE (present designation). BRAZIL: ♀, Dej. Brazil; Janson coll. 1903.130; *Opatelus limbatus* Cdze, Cand. [Janson]; *Agrypnus punctipennis* Dej. Cat. e coll. Dejean [Janson] (BMNH).

Paralectotypes. 2 ♂, 1 ♀, with the same labels as the lectotype (BMNH).

The absence of Candèze's and Dejean's labels is probably due to Janson (see p. 276).

### *Opatelus paleolatus* Candèze

*Opatelus paleolatus* Candèze, 1857 : 88.

Holotype. ♂, BRAZIL, Deyr.; Janson coll. 1903.130; *O. paleolatus* [Cand.]; *Opatelus paleolatus* Cdze, Cand., type (e coll. Deyrolle) [Janson] (BMNH).

### *ACROCRYPTUS* Candèze

*Cryptotarsus* R. A. Philippi, 1873 : 308. Type-species: *Cryptotarsus ater* R. A. Philippi, by monotypy. [Homonym of *Cryptotarsus* Kirsch, 1865 : 88 (Malachiidae).]

*Acrocryptus* Candèze, 1874 : 39. [Replacement name for *Cryptotarsus* R. A. Philippi not Kirsch.]

*Hexaulacus* Candèze, 1784 : 40. Type-species: *Hexaulacus reedi* Candèze by monotypy. [Synonymized by Golbach, 1970b : 307.]

GENERIC DIAGNOSIS. Each tarsal claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum does not form part of the margin of the mesocoxal cavity; mesepimeron forms part of the margin of the mesocoxal cavity (Text-fig. 3). Third antennal segment resembles the fourth; both are larger and of a different shape than the second segment. Antennal grooves deep, almost attaining the anterior coxae; the distance between the end of the groove and the coxal cavity equal to the width of the groove. Body clothed with scales; scales on the underside of the body narrower than those of the upper surface. Prothorax not constricted behind the anterior angles. Lateral carina of the prothorax attains

the anterior margin. Grooves for the reception of the anterior, middle and hind tarsae present on the propleurae, metasternum and first visible abdominal sternite. Scutellum simple, without carina. Second, third and fourth tarsal segments with small ventral lobes.

**HISTORY OF THE GENUS.** *Cryptotarsus* was established for a single species from Chile with grooves on the propleurae for the reception of the anterior tarsi. *Hexaulacus* was also established for a single Chilean species with grooves for the reception of the anterior, middle and hind tarsi on the propleurae, metasternum and first visible abdominal segment. Calvert (1889: 18) suggested that *C. ater* Philippi and *H. reedi* Candèze were conspecific but Fleutiaux was of the opinion that this could not be the case as Philippi mentions only one pair of tarsal grooves. Golbach (1970b: 306) examined the type of *C. ater* and found that six tarsal grooves are present as in *reedi*. As Golbach suggests, the position of the middle and hind legs probably prevented Philippi from seeing the tarsal grooves on the metasternum and abdomen.

#### SPECIES INCLUDED IN THE GENUS

##### *Acrocryptus ater* (Philippi)

*Cryptotarsus ater* R. A. Philippi, 1873: 308.

*Acrocryptus ater* (Philippi) Candèze, 1874: 39.

*Hexaulacus reedi* Candèze, 1874: 40. [Synonymized by Golbach, 1970b: 307.]

*Acrocryptus ater* Philippi. Holotype. CHILE: near Rancagua (MN, Santiago according to Golbach, 1970b: 306). Not examined.

*Hexaulacus reedi* Candèze. Holotype. CHILE: ♀, 53884 [Fry manuscript catalogue number recording locality and determination]; Reed; Chile, Valda.; Fry coll. 1905.100; *Hexaulacus reedi* Cdz. n. gen. n. sp. non *Cryptotarsus ater* [Cand.]; *Cryptotarsus ater* Ch. MS. [illegible] Valdivia; *Hexaulacus reedi* Candèze; Chile, type [Fry] (BMNH). Not lost as stated by Golbach (1970b: 307).

Rancagua is about four hundred miles north of Valdivia.

Nothing is known of the life-history or habits of this species.

#### *DILOBITARSUS* Latreille

*Dilobitarsus* Latreille, 1834: 142. Type-species: *Dilobitarsus tuberculatus* Latreille [= *Dilobitarsus bidens* (Fabricius)], by monotypy.

*Anacantha* Solier, 1851: 18. Type-species: *Anacantha sulcicollis* Solier, by monotypy.

##### Syn. n.

**GENERIC DIAGNOSIS.** Each tarsal claw with a group of setae at the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum does not form part of the margin of the mesocoxal cavity; mesepimeron forms part of the margin of the mesocoxal cavity (Text-fig. 3). Third antennal segment larger than the second, similar to the fourth. Antennal groove of variable depth, always extending beyond the anterior half of the prosternopleural suture. Body clothed with narrow scales. Prothorax not constricted behind the anterior angles; lateral carina present. Pronotum with or without tubercles. Propleurae and metasternum without

well defined grooves for the reception of the anterior and middle tarsae. Scutellum simple, without carina. Third and fourth tarsal segments with ventral lobes.

NOTES ON THE GENERIC SYNONYMY. Almost a hundred years ago Candèze (1874 : 39) drew attention to the fact that *Dilobitarsus* and *Anacantha* were not readily separable. Examination of the available material has shown that the three main characteristics used to separate the genera, the appearance of the prothorax, the length of the antennae and the antennal grooves vary considerably from one species to another. In my opinion the retention of the two genera cannot be justified.

Fleutiaux (1907b : 168) retained the genus *Anacantha* using the appearance of the pronotum as the diagnostic characteristic of the genus. He restricted the genus to the type-species and transferred the remaining species at that time assigned to the genus (*vitticollis* (Fairmaire & Germain), *marmorata* Candèze and *fairmairei* Candèze to *Adelocera* (sensu auctt., nec Latreille = *Lacon* Castelnau of the present work). In view of the known variability of the appearance of the prothorax in the Elateridae and the fact that at the present time the known species can be assigned to *Dilobitarsus* or *Lacon* on the basis of the structure of the tarsi, I do not consider Fleutiaux's action with regard to *vitticollis* and *marmorata* was justified. *A. fairmairei* is unknown to me. However it must be admitted that certain species at present assigned to *Dilobitarsus* or *Lacon* on the basis of the structure of the tarsi bear a strong resemblance to one another, e.g. *L. laticollis* (Candèze) and *D. abbreviatus* Candèze. See also the note on the structure of the fourth tarsal segment of *L. dubius* Candèze (p. 63). It seems possible that, as more material for study becomes available, the structure of the tarsi will be found to vary from one species to another in a manner which precludes this characteristic from being used to separate two genera.

HISTORY OF THE GENUS. The genus was established for a single Central American species. In the years which followed a number of species from both Central and South America and Africa were assigned to the genus. Schwarz (1902b) established the genus *Elasmosomus* to accommodate the African species. With the exception of Fleutiaux, workers have accepted *Dilobitarsus* and *Elasmosomus* as separate genera. Fleutiaux (1919 : 11) continued to assign African species to *Dilobitarsus* and may have advised Paulian (1947) to do the same when he described *fleutiauxi* (p. 104). For Fleutiaux's treatment of *Dilobitarsus* and *Elasmosomus* in 1941 see p. 101.

SEXUAL DIMORPHISM. In *sulcicollis* (Solier) and *crux* (Philippi) the males differ from the females in that the body is more slender, the lateral margins of the prothorax straight instead of arcuate and the antennae more strongly serrate and longer, attaining the posterior angles of the prothorax. In the remaining species known to me these differences are less apparent.

DISTRIBUTION. Central and South America. A single species, *pendleburyi* Fleutiaux from Borneo is also assigned to the genus.

BIOLOGY AND HABITS. Nothing is known of the life history and habits of *Dilobitarsus* species.

## SPECIES INCLUDED IN THE GENUS

The generic attributions of nineteen of the twenty-three species listed as *Dilobitarsus* in the Schenkling catalogue (1925) or described subsequently have been confirmed. *D. cuneatus* Candèze is transferred to *Lacon* (p. 62), *D. minutus* Candèze to *Adelocera* (p. 39) and *D. fleutiauxi* Paulian (1947) to *Elasmosomus* (p. 104). *D. impressicollis* Schwarz (1902d : 129) is unknown to me. Two of the species removed from *Anacantha* by Fleutiaux (1907b : 168) (*marmorata* and *vitticollis*) are assigned to *Dilobitarsus*. The third (*fairmairei* Candèze) is unknown to me. Finally, *crux* Philippi is extracted from synonymy with *vitticollis* and included in *Dilobitarsus* as a valid species.

***Dilobitarsus abbreviatus* Candèze**

*Dilobitarsus abbreviatus* Candèze, 1857 : 78.

The description is based on a single unidentified Brazilian specimen from the Germar collection submitted by Schaum.

Holotype. The holotype appears to have been lost. It cannot be found (see notes on the Schaum and Candèze collections, p. 280 and p. 271) in the BMNH or IRSNB, Brussels.

The generic attribution is based on the following specimen: ♂, Fry, Rio Jano; abbreviatus Cdz., Br. [Cand., green border] (IRSNB, Brussels).

***Dilobitarsus bicornis* Candèze**

*Dilobitarsus bicornis* Candèze, 1857 : 82.

The description is based on an unrecorded number of specimens from BRAZIL submitted by Riehl under the name *D. tuberculatus* Latreille.

Type-material: There are no specimens determined by Candèze in the BMNH. ?IRSNB, Brussels. The Riehl collection passed to the University Zoological Museum, Marburg (Horn & Kahle, 1936 : 225). Not examined.

The generic attribution is based on the following specimen: ♂, Rio de Janeiro. Dec. 1856. J. Gray; *Dilobitarsus bicornis* Cand. [Janson] (BMNH).

***Dilobitarsus bidens* (Fabricius)**

*Elater bidens* Fabricius, 1801 : 227.

*Dilobitarsus tuberculata* Latreille, 1834 : 143 [Synonymized by Candèze, 1857 : 83.]

*Dilobitarsus bidens* (Fabricius) Candèze, 1857 : 83.

*Elater bidens* Fabricius. The description is based on an unrecorded number of specimens from 'America meridionali D. Smidt Mus. D. Lund'.

Type-material: 1 ex., ZMU, Copenhagen according to Zimsen (1964 : 158). Not examined.

The interpretation of the species is based on specimens in the BMNH determined by Candèze and other workers.

*Dilobitarsus tuberculata* Latreille. The description is based on an unrecorded number of specimens approximately 6 lines [=13.5 mm] long from BRAZIL. This material should be in the BMNH (see p. 277) but the most careful searches have failed to discover any specimens with Latreille's determination label, or indeed any specimens bearing the name *tuberculata*. The specimen recorded below agrees so well with the description that I believe it may be part of Latreille's original material.

The interpretation of the species is based on the following specimen: BRAZIL: ♀, Dej. Brazil; *Brazilia* Latreille [probably Latreille]; Janson coll. 1903.130; *Agrypnus macrothorax* Dej. Cat., e coll. Dejean [Janson]; *Dilobitarsus bidens* F., Cdze., Cand. [Janson] (BMNH). Length: 15.8 mm.

The species is distinctive and there seems to be no good reason why Candèze's synonymy should not be accepted.

### ***Dilobitarsus cariosus* Candèze**

*Dilobitarsus cariosus* Candèze, 1889 : 71 (5).

Holotype. COLOMBIA: ♀, n.sp. *cariosus* Cdz. Col. Ptand [Cand., green border, last word illegible]; type [Cand.]; Collection E. Candèze; *Dilobitarsus cariosus* Cand. det E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

The published locality is 'Nouvelle Grenade', the name by which Colombia was known between 1831 and 1861.

### ***Dilobitarsus colombianus* Candèze**

*Dilobitarsus colombianus* Candèze, 1857 : 78.

LECTOTYPE (present designation). COLOMBIA: ♀, Laf. Columbia [sic]; Janson coll. 1903 : 130; *Agrypnus colombianus* Buq. Colombie, D. Jurgens [?Buquet]; *Dilobitarsus columbianus* [sic] Cdze, Cand., type e coll. de Laferté [Janson] (BMNH).

The published locality is 'Nouvelle Grenade' the name by which Colombia was known between 1831 and 1861. The absence of Candèze's determination is probably due to Janson (see p. 276).

### ***Dilobitarsus corrosus* Candèze**

*Dilobitarsus corrosus* Candèze, 1897 : 7.

LECTOTYPE (present designation). BOLIVIA: ♂, 1894, *corrosus* Cand. La Paz, Bolivie St. [Cand., green border]; type [Cand.]; Collection E. Candèze; *Dilobitarsus corrosus* Cand. det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

***Dilobitarsus crux* (Philippi) sp. rev., comb. n.**

*Adelocera crux* F. A. E. Philippi, 1860 : 247.

The description is based on an unrecorded number of specimens from 'terra Arancanorum' [S. CHILE, between 37°29'S. and 40°18'S. and bounded by the Pacific to the west and the Andes to the east].

Type-material: ?MN, Santiago (Horn & Kahle, 1936 : 208).

The present interpretation of *crux* is based on a number of specimens in the BMNH collection from Chile (*Reed*) determined by Candèze. They agree well with the description and differ from *vitticollis* (Fairmaire and Germain) (p. 100) with which Fleutiaux (1907b : 166) synonymized the species, in the following manner: The yellow scales on the pronotum are limited to the anterior and posterior angles, so that the dark scales clothing the rest of the surface form a well defined cross, the third antennal segment is distinctly shorter than the fourth and the propleural antennal groove is shallow posteriorly. There is also a slight but distinct difference in the shape of the tips of the lateral lobes of the aedeagus.

***Dilobitarsus deyrollei* Candèze**

*Dilobitarsus deyrollei* Candèze, 1857 : 79.

Syntype examined: COLOMBIA: ♂, Laf. Columbia [sic]; Janson coll. 1903 : 130; *Agrypnus bituberculatus* Buq. Colombie [?Buquet]; *Dilobitarsus deyrollei* Cdze, type e coll. de Laferté [Janson] (BMNH).

The published locality is 'Nouvelle Grenade' [S. Colombia, see *colombianus* above]. The absence of Candèze's determination label is probably due to Janson (see p. 276). Since the second syntype was in the collection of Deyrolle (see p. 274), in whose honour the species is named, the designation of the lectotype is postponed until this specimen has been located.

***Dilobitarsus eloini* Candèze**

*Dilobitarsus eloini* Candèze, 1874 : 35.

The description is based on an unrecorded number of specimens from CENTRAL AMERICA.

Type-material: ?IRSNB, Brussels.

The generic attribution based on the following specimen, which may be a syntype: ♀, *Dilobitarsus eloini* Cdz., Mexique [Cand.]; *Dilobitarsus eloini* Cand. Mexico, type [Gahan]; coll. Janson, ex Candèze (BMNH).

***Dilobitarsus gracilis* Candèze**

*Dilobitarsus gracilis* Candèze, 1874 : 35.

LECTOTYPE (present designation). BRAZIL: ♀, Bates coll. Ega; Janson coll. 1903 : 130; *Dilobitarsus gracilis mihi* n.sp. [Janson, 'mihi. n.sp.' is crossed out and replaced by 'Candèze' by Gahan] (BMNH).

Paralectotype. BRAZIL: ♀, Bates coll. Japajos [sic]; Janson coll. 1903 : 130; *Dilobitarsus gracilis mihi* var. [Janson, 'mihi' is crossed out and replaced by 'Cand.' by Gahan see p. 276] (BMNH). The published localities are R. Tapajos, Ega and Para. The material from Para has not been traced.

***Dilobitarsus inopinus* Candèze**

*Dilobitarsus inopinus* Candèze, 1874 : 35.

LECTOTYPE (present designation). NICARAGUA: ♀, Nicaragua/EMJ; Janson coll. 1903 : 130; *Dilobitarsus inopinus mihi*, type [Janson, 'mihi' is crossed out and replaced with 'Candèze' by Gahan] (BMNH).

***Dilobitarsus irroratus* Candèze**

*Dilobitarsus irroratus* Candèze, 1857 : 80.

LECTOTYPE (present designation). COLOMBIA: ♀, Laf. N. Grenada; Nov. Grenada, Goudot; Janson coll. 1903.130; *Dilobitarsus irroratus* Cdze., type e coll. de Laferté [Janson] (BMNH).

Paralectotype. ♀, Laf. N. Grenada; Janson coll. 1903.130; *Dilobitarsus irroratus* Cdze, type e coll. de Laferté [Janson] (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276). N. Grenada = Colombia, see *D. colombianus*, p. 96.

***Dilobitarsus laconoides* (Fleutiaux) comb. n.**

*Anacantha marmorata* Candèze, 1874 : 38.

*Adelocera marmorata* (Candèze) Fleutiaux, 1907b : 163. [Junior secondary homonym of *Adelocera marmorata* (Fabricius, 1801).]

*Adelocera laconoides* Fleutiaux, 1907b : 163. [Replacement name for *Adelocera marmorata* (Candèze).]

*Lacon* (*Cornilacon*) *laconoides* (Fleutiaux); Golbach, 1969 : 158.

LECTOTYPE (present designation). CHILE: ♂, Chili, Reed; 53883 [Fry coll. catalogue number = type from Reed coll.]; *Dilobitarsus marmorata* Cdz. s.n. [Cand.] (BMNH).

***Dilobitarsus lignarius* Candèze**

*Dilobitarsus lignarius* Candèze, 1857 : 80.

LECTOTYPE (present designation). BRAZIL: ♀, Dej. B. Ayres. Braz.; *Dilobitarsus lignarius* (Dej.) Cand. type, Cdze [Janson]; *Agrypnus lignarius* Dej. Cat. e coll. Dejean [Janson] (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Dilobitarsus nebulosus* Candèze**

*Dilobitarsus nebulosus* Candèze, 1874 : 32.

Holotype. FRENCH GUIANA: ♀, Cayenne; Janson coll. 1903 : 130; coll. Janson ex. Candèze; ex. coll. Castelnau [Cand.]; *D. nebulosus* Cdze., type unique [Cand.]; *Dilobitarsus nebulosus* Cand., type ex. coll. Castelnau [Gahan] (BMNH).

***Dilobitarsus nubilus* Candèze**

*Dilobitarsus nubilus* Candèze, 1857 : 83.

LECTOTYPE (present designation). COLOMBIA: ♂, Laf. N. Grenada; Janson coll. 1903 : 130; Nov. Grenada, Goudot; *Dilobitarsus nubilus* Cdze., Cand., type e coll. de Laferté [Janson] (BMNH).

Paralectotype. ♀, Laf. N. Grenada; Janson coll. 1903 : 130; *Dilobitarsus nubilus* Cdze, Cand., type e coll. de Laferté [Janson] (BMNH).

***Dilobitarsus pendleburyi* Fleutiaux**

*Dilobitarsus pendleburyi* Fleutiaux, 1934d : 178.

Holotype: ♂, N. BORNEO, Bettotan, Nr. Sandakan, Aug. 13, 1927/C.B.K. & H.M.P., F.M.S. Museums; Brit. Mus. 1934.80 [=presented by Imp. Inst. Ent.]; *Dilobitarsus pendleburyi* Fleut., type [Fleut.] (BMNH). N. Grenada = Colombia, see *D. colombianus*, p. 96.

***Dilobitarsus petiginosus* Germar**

*Dilobitarsus petiginosus* Germar, 1840 : 246; pl. 1, fig. 3.

The description is based on an unrecorded number of specimens from Brazil.

Type-material: not located. For the history of the Germar collection see p. 000.

The generic attribution is based on the figure.

***Dilobitarsus quadrituberculatus* Candèze**

*Dilobitarsus quadrituberculatus* Candèze, 1857 : 81.

The description is based on an unrecorded number of specimens from St Catherine, Brasil.

Type-material: not found in BMNH. ?IRSNB, Brussels.

Generic attribution is based on the following specimen: ♂, Laf. Minas Ger. Brasil; Janson coll. 1903 : 130; *Dilobitarsus quadrituberculatus* Cdze, Cand., e coll. de Laferté [Janson] (BMNH). This specimen agrees well with Candèze's description of the variety with longitudinal red marks on the elytra and may be the specimen on which he based the description.

***Dilobitarsus subsulcatus* Candèze**

*Dilobitarsus subsulcatus* Candèze, 1874 : 34.

LECTOTYPE (present designation). ECUADOR: ♂, Ecuador/Macas. [Janson]; Janson coll. 1903.130; *D. subsulcatus* Cdz., type [Cand.]; *Dilobitarsus subsulcatus* Cand. type. Ecuador [Gahan] (BMNH).

The published locality is Equateur, the French form of Ecuador. Janson obviously re-labelled the specimen to conform with the accepted English name of the locality.

***Dilobitarsus sulcicollis* (Solier) comb. n.**

*Anacantha sulcicollis* Solier, 1851 : 18.

LECTOTYPE (present designation). CHILE: ♂, Museum Paris, Chili, Cl. Gay, 1845; *Anacantha sulcicollis* Sol. Chili. [Solier]; type du Solier [Fleut.] (MNHN, Paris).

Fleutiaux (1907 : 169) states that he has no hesitation in synonymizing *Adelocera angustata* F. Philippi, 1861 with *sulcicollis* Solier despite the fact that he has not seen the type of the former (? NM, Santiago, Horn & Kahle, 1936 : 208). I have been unable to obtain a copy of the original description of *angustata*. It appears to have been based on material collected at Valdivia (F. Philippi, 1887 : 83).

***Dilobitarsus tessellatus* Candèze**

*Dilobitarsus tessellatus* Candèze, 1874 : 32.

LECTOTYPE (present designation). BRAZIL: ♀, N. Frib.; Janson coll. 1903.130; *Dilobitarsus tessellatus* Cdz. [Cand.]; *Dilobitarsus tessellatus* Cand., type. N. Fribourg [Gahan]; *Dilobitarsus tessellatus* Cdz. in litt. ined. coll. Deyrolle N. Fribourg [Janson] (BMNH).

***Dilobitarsus vitticollis* (Fairmaire & Germain) comb. n.**

*Adelocera vitticollis* Fairmaire & Germain, 1860 : 268.

*Anacantha vitticollis* (Fairmaire & Germain) Candèze, 1874 : 37.

*Lacon* (*Cornilacon*) *vitticollis* (Fairmaire & Germain) Golbach, 1969 : 158.

The description is based on an unrecorded number of specimens from Concepcion [CHILE]. Fleutiaux (1907b : 167) records that 'le type primitif de Fairmaire' was acquired by the IRSNB, Brussels, with Candèze's last collection. This has not been confirmed.

The generic attribution is based on the following specimen: ♂, Chili coll. Germ.; Janson coll. 1903 : 130; *Adelocera vitticollis* L.f. [unknown mss.] Rev. & Mag. Zool. 1840 [sic], p. 268 [another mss.] (BMNH).

The specimen agrees well with the description and is not conspecific with *D. crux* (Philippi) (q.v.).

**ELASMOSOMUS** Schwarz

*Elasmosomus* Schwarz, 1902b : 212. Type-species: *Elasmosomus fasciculatus* Schwarz, by subsequent designation (Hyslop, 1921 : 643).

**GENERIC DIAGNOSIS.** Each claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum does not form part of the margin of the mesocoxal cavity; mesepimeron forms part of the margin of the mesocoxal cavity (Text-fig. 3). Second and third antennal segments not subequal, the third resembles the fourth and following segments. Antennal groove shallow and short, not extending beyond the anterior half of the prosternopleural suture. Body clothed with narrow scales. Prothorax cylindrical, elongate, not constricted behind the anterior angles. Lateral carina present, pronotal tubercles present or absent. Propleurae and metasternum without well defined grooves for the reception of the anterior and middle tarsi. Scutellum simple, without longitudinal carinae. Third and fourth tarsal segments with ventral lobes.

**RANGE OF VARIATION FOUND WITHIN THE GENUS.** All the species known to me bear a strong resemblance to one another. Examination of long series of specimens suggests that there may be a wide range of variation in the length of individual specimens belonging to the same species.

**HISTORY OF THE GENUS.** The genus was established for the African species attributed to the genus *Dilobitarsus*, which originally included only South American species.

Schwarz originally included the genus in the tribe Dicrepidini but four years later (1906 : 15) he transferred it to the Agrypnini [sic, see p. 4] without comment. Fleutiaux (1941), who on a previous occasion (1919 : 11) did not recognize *Elasmosomus* as a valid genus, preferring to use *Dilobitarsus* for both African and South American species, treated them as two entirely distinct genera. He included *Dilobitarsus* in the Agrypnitae [sic, see p. 4] but excluded *Elasmosomus*, basing his action on the fact that the structure of the head of *Elasmosomus* species bears a certain resemblance to that found in *Anaspasis* (S. America) and *Protelater* (New Zealand). Examination of the type-species of these two genera has shown that the resemblance is only superficial. Both genera differ from *Elasmosomus* in that they possess tibial spurs and lack setae at the base of the claws. Further studies may show that *Elasmosomus* should not be included in the Agrypninae but at the present time there is, in my opinion, no convincing reason for excluding the genus from the subfamily.

The main difference between *Elasmosomus* and *Dilobitarsus*, apart from the distribution, is that in the former the antennal grooves are distinctly shorter and shallower than in the latter. Only the characteristic cylindrical shape of the body, the tubercles on the head and the fact that the frons is not margined anteriorly distinguishes *Elasmosomus* from *Hemicleus*. However as no intermediate forms are known and there is no difficulty in assigning species to the appropriate genus, the two genera have been retained in the present work.

**DISTRIBUTION.** Africa and Madagascar.

**BIOLOGY AND HABITS.** Nothing has been published on the life history and habits of *Elasmosomus* species. A few specimens known to me bear labels indicating that they were found on trees or in tree stumps.

SEXUAL DIMORPHISM. The species known to me do not appear to display any distinct sexual dimorphism.

#### SPECIES INCLUDED IN THE GENUS

The Schenkling catalogue (1925 : 18) lists the names of twenty-six species, of which three are regarded as synonyms. Three species have been described since the publication of the catalogue. The generic attribution of all these species has been confirmed, either by examination of the type-material, determined material or from the description. It has not been possible to confirm all the synonymies. One species, *Dilobitarsus fleutiauxi* Paulian, 1947, is here transferred to *Elasmosomus*. As it is a secondary junior homonym of *E. fleutiauxi* Schwarz, 1906, the replacement name *delamarei* is proposed.

#### *Elasmosomus alluaudi* (Candèze)

*Dilobitarsus alluaudi* Candèze, 1895b : 52.

*Elasmosomus alluaudi* (Candèze) Schwarz, 1902b : 297.

The description is based on an unrecorded number of specimens from Madagascar, Diego-Suarez, Montagne d'Ambre collected and submitted by Alluaud.

Syntypes examined: MADAGASCAR: 1 ♀, Madagascar, Diego Suarez 17, Ch. Alluaud, 1893; *Dilobitarsus alluaudi* Cand. [Cand.] Cand. det. [Fleut.]. 1 ♀, same locality and collector; *alluaudi* Cand. Comparé au type, Mus. Brux. 1902 [Fleut.]; *Dilobitarsus alluaudi* Cand., ex type. 5 ex., same locality and collector (MNHN, Paris).

The designation of a lectotype is postponed until the 'type' material in the IRSNB, Brussels, to which Fleutiaux's label and Fleutiaux (1902c; 298) refers, has been examined.

#### *Elasmosomus apicalis* Schwarz

*Elasmosomus apicalis* Schwarz 1905b : 275.

The description is based on an unrecorded number of specimens from [TANZANIA] Usambara, Nguela.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the description.

#### *Elasmosomus bacillus* (Candèze)

*Dilobitarus bacillus* Candèze, 1881 : 3.

*Elasmosomus bacillus* (Candèze) Schwarz, 1902b : 214.

The description is based on an unrecorded number of specimens from ABYSSINIA, collected by Raffray.

Type-material: IRSNB, Brussels, according to Fleutiaux (1902c : 298). Not confirmed.

The generic attribution is based on the description.

***Elasmosomus bituberculatus* (Fleutiaux)**

*Dilobitarsus bituberculatus* Fleutiaux, 1902c : 299.

*Elasmosomus bituberculus* Schwarz, 1906 : 15. [Unjustified emendation.]

LECTOTYPE (present designation). SAN THOMÉ: 1 ♀, San Thomé, *Dilobitarsus*, *bituberculatus* Fleut., type [Fleut.] (MNHN, Paris).

***Elasmosomus brunneiventris* Schwarz**

*Elasmosomus brunneiventris* Schwarz, 1902b : 217.

The description is based on an unrecorded number of specimens from Kamerun [CAMEROUN].

Type-material: ?DEI, Eberwalde.

The generic attribution is based on the following specimen: 1 ♀, Kamerun, Conradt; *brunneiventris* Schw. det. Quelle [?Quelle] (MNHN, Paris).

***Elasmosomus cornutus* (Candèze)**

*Dilobitarsus cornutus* Candèze, 1865 : 8.

*Elasmosomus cornutus* (Candèze) Schwarz, 1902b : 314.

Candèze recorded the locality as Guinée (probably in the old commercial sense; the name was commonly used to denote the Atlantic coastal region of Africa from Cape Verga, 10°18'N. to Cape Negro, 15°45'S.). He also refers to a specimen from Old Calabar submitted by Murray and another, presumably from the same locality, in the Saunders collection.

Type-material: IRSNB, Brussels, according to Fleutiaux (1902c : 298). Not confirmed.

According to Horn & Kahle (1936 : 186, 239, 380) Murray's and part of Saunders' collections are in the BMNH. The BMNH does not possess any *cornutus* specimens from these collections or from the Candèze collection. The remainder of the Saunders collection is in the Fleutiaux collection (MNHN, Paris). Not located, 1971.

The generic attribution is based on the following specimen: CONGO (BRAZZAVILLE): 1 ♀, Benito, Congo Franc.; *cornutus* Cand. comparé type, Mus. Brux. 1902 [Fleut.] (MNHN, Paris).

***Elasmosomus cylindricus* (Fleutiaux)**

*Dilobitarsus cylindricus* Fleutiaux, 1902c : 300.

*Elasmosomus cylindricus* (Fleutiaux) Schwarz, 1906 : 15.

LECTOTYPE (present designation). CONGO (BRAZZAVILLE): ♀, Benito, Congo Franc; *Dilobitarsus cylindricus* Fleut., type (Fleut.) (MNHN, Paris).

***Elasmosomus delamarei* nom. n.**

*Dilobitarsus fleutiauxi* Paulian, 1947 : 7, fig.

*Elasmosomus fleutiauxi* (Paulian) **comb. n.** [Secondary junior homonym of *Elasmosomus fleutiauxi* Schwarz, 1906.]

Holotype. IVORY COAST: ♀, Côte d'Ivoire, Reserve du Blanco, R. Paulian & G. Delamare; Reseu noq. fre. 8<sup>H</sup> [illegible]; *Dilobitarsus* [Fleut.]; *Dilobitarsus fleutiauxi* n.sp. [Paulian] (MNHN, Paris).

The published locality is: Côte d'Ivoire, reserve forestière du Banco en battent la lisière d'une clarière à 8 heures du matin, ix.1945, R. Paulian et C. Delamare-Deboutville.

***Elasmosomus edmundi* Quelle**

*Elasmosomus edmundi* Quelle, 1955 : 228.

Holotype. CAMEROUN: Kamerun, Johann Albrechtshöhe (Conradt, 1897) (NMHU, Berlin). Not examined.

The generic attribution is based on the description.

***Elasmosomus fasciculatus* Schwarz**

*Elasmosomus fasciculatus* Schwarz, 1902b : 214.

The description is based on an unrecorded number of specimens from Kamerun [CAMEROUN].

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the description.

***Elasmosomus filiformis* (Candèze)**

*Dilobitarsus filiformis* Candèze, 1882 : 3.

*Elasmosomus filiformis* (Candèze) Schwarz, 1902b : 214.

The description is based on an unrecorded number of specimens from ABYSSINIA collected by Raffray.

Type-material: IRSNB, Brussels according to Fleutiaux, 1902c : 299. Not confirmed.

The generic attribution is based on the description.

Fleutiaux (1902c : 299) regards this species as a synonym of *E. raffrayi* (Candèze, 1878). The synonymy has not been confirmed.

***Elasmosomus filum* (Candèze)**

*Dilobitarsus filum* Candèze, 1897 : 7.

*Elasmosomus filum* (Candèze) Schwarz, 1902b : 214.

The description is based on an unrecorded number of specimens from GABON.

Type-material: IRSNB, Brussels, according to Fleutiaux (1902c : 298). Not confirmed.

The generic attribution is based on the description.

***Elasmosomus fleutiauxi* Schwarz**

*Dilobitarsus linearis* Fleutiaux, 1902c : 301.

*Elasmosomus fleutiauxi* Schwarz, 1906 : 15. [Replacement name for *Elasmosomus linearis* (Fleutiaux), secondary junior homonym of *E. linearis* Schwarz 1902b : 219.]

LECTOTYPE (present designation). CONGO (BRAZZAVILLE): ♀, Benito, Congo Franc; *Dilobitarsus linearis* Fleut, type [Fleut] (MNHN, Paris)

***Elasmosomus humeralis* Schwarz**

*Elasmosomus humeralis* Schwarz, 1902b : 218.

The description is based on an unrecorded number of specimens from Kamerun [CAMEROUN]

Type-material: ? DEI, Eberswalde

The generic attribution is based on the description.

***Elasmosomus jeanneli* Mouchet**

*Elasmosomus jeanneli* Mouchet, 1949 : 113.

Holotype. MADAGASCAR: ♀, Madagascar. Coll. A. Sicard, 1930; Mont d'Ambre; Décembre; *Elasmosomus jeanneli*, type [Mouchet] (MNHN, Paris).

Paratypes examined: 11 specimens bearing 'cotype' labels: 1 ex., same date, locality and collection as holotype. 1 ex., same date and locality as holotype. 3 ex., same locality and collection as holotype, one specimen bears the date 'octobre'. 1 ex., Février; Madagascar Coll. A. Sicard, 1930. 5 ex., same collection as holotype, four specimens are labelled '*Dilobitarsus*' (MNHN, Paris).

The Mouchet collection also contains paratypes (see description). Mouchet does not record the number of paratypes in each collection.

***Elasmosomus linearis* Schwarz**

*Elasmosomus linearis* Schwarz, 1902b : 218.

The description is based on an unrecorded number of specimens from Kamerun [CAMEROUN]

Type-material: ? DEI, Eberswalde.

The generic attribution is based on the description.

***Elasmosomus mirificus* (Candèze)**

*Dilobitarsus mirificus* Candèze, 1895 : 48.

*Elasmosomus mirificus* (Candèze) Schwarz, 1902b : 214.

The description is based on a single specimen from TOGO submitted by Kraatz.

Holotype: IRSNB, Brussels according to Fleutiaux (1902c : 298). Not confirmed.

The generic attribution is based on the description.

***Elasmosomus mocquerysi* (Fleutiaux)**

*Dilobitarsus mocquerysi* Fleutiaux, 1902c : 300.

*Elasmosomus mocquerysi* (Fleutiaux) Schwarz, 1906 : 15.

LECTOTYPE (present designation). SÃO THOMÉ: ♀, Sao Thomé; *Dilobitarsus mocquerysi* Fleut., type [Fleut.]; Ann. Soc. Ent. Belge 1902 pp. 297 et 300 [Fleut.] (MNHN, Paris).

Paralectotype: 1 ex., Sao Thomé (MNHN, Paris).

***Elasmosomus parallelus* Schwarz**

*Elasmosomus parallelus* Schwarz, 1902b : 218.

The description is based on an unrecorded number of specimens from Kamerun [CAMEROUN].

Type-material: ? DEI, Eberswalde.

The generic attribution is based on the description.

***Elasmosomus pauliani* Mouchet**

*Elasmosomus pauliani* Mouchet, 1949 : 113.

Holotype. MADAGASCAR: Baie d'Antongil, M. Mocquerys, 1898; *Elasmosomus pauliani*, type [Mouchet] (MNHN, Paris).

Paratype: ♀, same locality as the holotype (Mouchet collection). Not examined.

***Elasmosomus pulchellus* Schwarz**

*Elasmosomus pulchellus* Schwarz, 1905b : 273.

The description is based on an unrecorded number of specimens from TOGO.

Type-material: ? DEI, Eberswalde.

The generic attribution is based on the description.

***Elasmosomus pulcher* Schwarz**

*Elasmosomus pulcher* Schwarz, 1905b : 275.

The description is based on an unrecorded number of specimens from Kamerun, Balanga [CAMEROUN].

Type-material: ? DEI, Eberswalde.

The generic attribution is based on the description.

***Elasmosomus raffrayi* (Candèze)**

*Dilobitarsus raffrayi* Candèze, 1878b : LII (6).

*Elasmosomus raffrayi* (Candèze) Schwarz, 1902b : 214.

The description is based on two specimens from Zanzibar [TANZANIA] collected by Raffray.

Syntypes: 1 ex., Candèze collection (IRSNB, Brussels). Not examined. 1 ex., MCZN, Genoa.

The generic attribution is based on the following specimen: 1♂, Zanzibar, Raffray; *Dil. raffrayi* Cand. [Cand.]; Coll. Alluaud, ex type *raffrayi* Cand. [Fleut.] (MNHN, Paris). Unless one of the two syntypes believed to be in the IRSNB, Brussels and MCZN, Genoa are found to be missing, this specimen cannot be part of the syntype series.

Fleutiaux (1902c : 299) lists *E. ramusculus* (Candèze) described from Togo (see below) and *E. filiformis* (Candèze) from Abyssinia (see p. 104) as synonyms. The synonymies have not been confirmed.

***Elasmosomus ramusculus* (Candèze)**

*Dilobitarsus ramusculus* Candèze, 1895a : 47.

*Elasmosomus ramusculus* (Candèze) Schwarz, 1902b : 214.

The description is based on a single specimen from Togo submitted by Kraatz.

Holotype: IRSNB, Brussels according to Fleutiaux, 1902c : 299. Not confirmed.

Fleutiaux (1902c : 299) places this species in synonymy with *raffrayi* Candèze. The synonymy has not been confirmed.

***Elasmosomus signifer* (Candèze)**

*Dilobitarsus signifer* Candèze, 1895b : 53.

*Dilobitarsus perrieri* Fairmaire, 1901 : 169. [Synonymized by Fleutiaux, 1902c : 299.]

*Elasmosomus signifer* (Candèze) Schwarz, 1902b : 214.

*Dilobitarsus signifer* Candèze. Holotype. MADAGASCAR: ♀, Madagascar, coll. Ch. Alluaud; *D. signifer* Cand. [Cand.] Cand. det. (MNHN, Paris).

The published locality is Diego-Surarez, Montague d'Ambre.

*Dilobitarsus perrieri* Fairmaire. LECTOTYPE (present designation), MADAGASCAR: Perrier [Fairm.]; Museum Paris, Madagascar, Perrier de la Bathie; *Dilobitarsus* [Fleut.] *perrieri* Frm., type [Fairm.]; *signifer* Cand., minor, *perrieri* Fairm. [Fleut.] (MNHN, Paris).

The published locality is Madagascar, Bélumbé (*H. Perrier*).

***Elasmosomus sobrinus* (Candèze)**

*Dilobitarsus sobrinus* Candèze, 1895a : 45.

*Elasmosomus sobrinus* (Candèze) Schwarz, 1902b : 214.

Holotype: TOGO, submitted by Kraatz. IRSNB, Brussels according to Fleutiaux. (1902c : 298). Not confirmed.

The generic attribution is based on the following specimen: ♀. Togo. *D. sobrinus* Cand. [Cand.]; Coll. Alluaud, ex type Cand. [Fleut.] (MNHN, Paris). This specimen cannot be part of the type-series as Candèze records only a single specimen.

***Elasmosomus undulatus* Schwarz**

*Elasmosomus undulatus* Schwarz, 1902b : 215.

The description is based on an unrecorded number of specimens from Kamerun [CAMEROUN].

Type-material: ? DEI, Eberswalde.

The generic attribution is based on the description.

***Elasmosomus variegatus* (Fleutiaux)**

*Dilobitarsus variegatus* Fleutiaux, 1902c : 301.

*Elasmosomus variegatus* (Fleutiaux) Schwarz, 1906 : 15.

LECTOTYPE (present designation). CONGO (BRAZZAVILLE): ♀, Benito, Congo Franc; *Dilobitarsus variegatus* Fleut., type [Fleut] (MNHN, Paris).

***Elasmosomus vicinus* (Candèze)**

*Dilobitarsus vicinus* Candèze, 1895b : 53.

*Elasmosomus vicinus* (Candèze) Schwarz, 1902b : 214.

Syntypes examined: MADAGASCAR: 1 ex., Madagascar, Diego-Suarez, 17, Ch. Alluaud 1893; *D. vicinus* Cand., Cand. det. [Cand.]. 6 ex., same locality without determination labels. 1 ♀, Diego Suarez, Alluaud; *vicinus* Cand., comparé au type Mus. Brux. 1902 [Fleut.]; *Dilobitarsus vicinus* Cand., ex type [Fleut.]. 1 ex., same locality without determination label (MNHN, Paris).

The description is based on an unrecorded number of specimens from Diego Suarez, Montagne d'Ambre, collected and submitted by Alluaud. Fleutiaux (1902c : 298) and the note on one specimen referring to the 'type' in the IRSNB, Brussels, suggests that Candèze did not return all the material to Alluaud, but retained a specimen or specimens for his own collection. Designation of the lectotype is postponed until this material has been examined.

***HEMICLEUS* Candèze**

*Hemicleus* Candèze, 1857 : 180. Type-species: *Hemicleus caffer* Candèze, by monotypy.

GENERIC DIAGNOSIS. Each claw with a group of setae near the base (Text-fig. 11). Mesepisternum does not form part of the margin of the mesocoxal cavity; mesepimeron forms part of

the margin of the mesocoxal cavity (Text-fig. 3). Second and third antennal segments not subequal, the third segment resembles the fourth. Antennal groove shallow and short, not extending beyond half the length of the sternopleural suture. Body clothed with narrow scales. Prothorax moderately convex but not cylindrical; without constriction behind the anterior angles. Lateral carinae present. Pronotum without tubercles. Propleurae and metasternum without well defined grooves for the reception of the anterior and middle tarsi. Scutellum simple, without carina. Third and fourth tarsal segments with ventral lobes.

Structurally the genus bears a certain resemblance to *Elasmosomus* and is distinguished from it only by its general appearance, the body being less cylindrical and the pronotum entirely devoid of tubercles. Within the subfamily these characteristics are not generally of any value at the generic level, but as there is no difficulty in assigning the known species to one genus or the other both genera have been retained in the present work.

**HISTORY OF THE GENUS.** The genus was established for a single species. It has gained general acceptance and over the years a number of new species have been described.

**SEXUAL DIMORPHISM.** The species appear to be indistinguishable externally.

**DISTRIBUTION.** Africa.

**BIOLOGY AND HABITS.** Nothing is known of the life history and habits of *Hemicleus* species.

#### SPECIES INCLUDED IN THE GENUS

Schenkling (1925 : 20 & 514) lists thirteen species and six have been described subsequently. The generic attribution of sixteen species has been confirmed. One species, *planus* Fleutiaux is transferred to *Adelocera* and another, *jeanneli* Fleutiaux transferred from the same genus. The remaining two species (*adspersulus* Klug and *majusculus* Candèze) are unknown to me.

#### *Hemicleus apicalis* Schwarz

*Hemicleus apicalis* Schwarz, 1898b : 183

Syntype examined. TANZANIA: ♀, Usamb. Weise; Coll Schwarz; Typus; *apicalis* Schw. [Schwarz] (DEI, Eberswalde).

The published locality is Usambara.

#### *Hemicleus caffer* Candèze

*Hemicleus caffer* Candèze, 1857 : 181; pl. 3, fig. 3.

The description is based on an unrecorded number of specimens from 'Cafrerie' [SOUTH AFRICA] submitted by Dohrn.

Type-material. Not located in BMNH. ? IRSNB, Brussels (see p. 271) or possibly in the Dohrn collection in the IZPAN, Warsaw.

The generic attribution is based on the following specimen; 1 ♂, illegible locality; Afr. Sud: *Hemicleus caffer* Cand. [Fleut.] (MNHN, Paris).

***Hemicleus cardiophoroides* Fleutiaux**

*Hemicleus cardiophoroides* Fleutiaux, 1919 : 13.

LECTOTYPE (present designation). KENYA: ♀, Afr. or. Anglaise, Taveta, Alluaud & Jeannel, Mars 1912, st. 65; *Hemicleus cardiophoroides* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. TANZANIA: ♀, Afr. or. Allemande; Kilimandjaro, versant sud-est, Alluaud & Jeannel; Zone inferieure, Neu Moschi, 800 m. Avril 1912, st. 72; conforme à caffer in coll. Cand. Afr. orient. J. Hub. . . . [illegible]; Nov. 1930; non le type [Fleut.] (MNHN, Paris).

The meaning of Fleutiaux's note on the paralectotype is not clear. There does not seem to be any obvious difference between this specimen and the lectotype.

***Hemicleus chappuisi* Fleutiaux**

*Hemicleus chappuisi* Fleutiaux, 1935b : 197: fig. 3.

LECTOTYPE (present designation). ETHIOPIA: ♀, Ethiopie Merid. Nanaropus, Bords du Rudolphe, 565 m; Museum Paris, Mission de L'Omo. C. Arambourg, P.-A Chappuis & R. Jeannel; *Hemicleus chappuisi* Fleut., type [Fleut.] (MNHN, Paris).

***Hemicleus dorsalis* Schwarz**

*Hemicleus dorsalis* Schwarz, 1898a : 183.

Syntypes examined. CAMEROUN: 1 ex., Kameroun; Coll. Schwarz; Typus; *dorsalis* Schw. [Schwarz] (DEI, Eberswalde). 1 ex., Kamerun Conrad; *Hemicleus dorsalis* Schw. [Fleut.] (MNHN, Paris). I have no doubt that this specimen originally formed part of the syntype-series and that it was subsequently acquired by Fleutiaux.

The description is based on an unrecorded number of specimens collected by Conrad and submitted by Kraatz.

***Hemicleus duplicatus* nom. n.**

*Hemicleus jeanneli* Fleutiaux, 1935b : 196; fig. 2. [Junior secondary homonym of *Hemicleus jeanneli* (Fleutiaux, 1919).]

LECTOTYPE (present designation). KENYA: ♀, Kenya, Env. de Lokitanyalla, West Suk-Turkana, 1,200 m; *Hemicleus duplicatus* Fleut., n.n.p. *jeanneli* Miss. Omo 1935 [Fleut.] (MNHN, Paris).

Fleutiaux appears to have been aware that *Adelocera jeanneli* Fleutiaux, 1919 should be assigned to *Hemicleus* (see p. 111) and that *H. jeanneli* (Fleutiaux, 1935) therefore required a new name. Although he altered the names on the specimens he did not publish the new combination or the new name.

***Hemicleus elegans* Fleutiaux**

*Hemicleus elegans* Fleutiaux, 1935c : 94.

LECTOTYPE (present designation). ? E. AFRICA: ♀, R. E. Dent, Chania R. 7800, July 1929; *Hemicleus elegans* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 1 ♂, R. E. Dent, Chania R. 7800, July 1929; *Hemicleus elegans* Fleut., co-type [Fleut.] (MNHN, Paris). 1 ♂, R. E. Dent, Ghania [sic] R. 7,800, July 1929. *Hemicleus elegans* Fleut. [Fleut.] (NM, Nairobi).

The position of the published locality, Chania River, is unknown to me.

***Hemicleus fasciculatus* Schwarz**

*Hemicleus fasciculatus* Schwarz, 1905b : 276.

Syntype examined. CAMEROUN: ♀, Kamerun, Barombi, Conrad; Coll. Schwarz; Typus; *fasciculatus* Schw. [Schwarz] (DEI, Eberswalde).

***Hemicleus ferrantei* Buysson**

*Hemicleus ferrantei* Buysson, 1911 : 19.

The description is based on an unrecorded number of specimens from [EGYPT] 'Luxor, premiers jours de juillet 1908, 1909, 1910 (coll. Ferranti).' The Ferranti collection is now in the possession of the Entomological Society of Egypt (Horn & Kahle, 1935: 74). Not confirmed.

Syntypes examined. 1 ♂, Luxor, 2.vii.10; Luxor, Ferranti; *Hemicleus ferrantei* Du B. Egypte [du Buysson]. 2 ♂, Luxor, 7.vii.09, G. Ferranti (MNHN, Paris). These specimens were presumably retained by du Buysson and were acquired by the MNHN, Paris with his collection.

The designation of the lectotype is postponed until the remainder of the series has been examined.

***Hemicleus inordinatus* Fleutiaux**

*Hemicleus inordinatus* Fleutiaux, 1932b : 2.

LECTOTYPE (present designation). MOZAMBIQUE: ♂, Museum Paris, Afr. or. port., Nova Choupanga, Dr Lesne, 1928; Avril; Boite 16; *Hemicleus inordinatus* Fleut., type [Fleut.] (MNHN, Paris).

***Hemicleus jeanneli* (Fleutiaux) comb. n.**

*Adelocera jeanneli* Fleutiaux, 1919 : 10.

Holotype. TANZANIA: ♀, Afr. or. Allemande, Kilimandjaro, versant sud-est, Alluaud & Jeannel; Zone inferieur, Neu Moschi, 800 m, Avril 1912, st. 72; *Adelocera jeanneli* Fleut., type [Fleut.]; *Hemicleus non Adelocera* [Fleut.] (MNHN, Paris).

Fleutiaux did not publish the transference of this species to *Hemicleus*.

***Hemicleus longicollis* Schwarz**

*Hemicleus longicollis* Schwarz, 1905b : 277.

Syntype examined. ETHIOPIA: ♂, Galla, R. V. Erlanger; Coll Schwarz; Typus; longicollis Schw. [Schwarz] (DEI, Eberswalde).

The published locality is Somali. It seems probable that the name Galla refers to the tribe inhabiting the country 150 miles south of Addis Ababa and not the hills of the same name 20 miles south of the equator, 40°E., in Kenya.

***Hemicleus normandi* Buysson**

*Hemicleus normandi* Buysson, 1920 : 12.

LECTOTYPE (present designation). TUNISIA: T. le Kef, Dr Normand; *Hemicleus normandi* Buyss [Buyss.] (MNHN, Paris).

Paralectotype: 1 ♂, T. le Kef, Dr Normand, *Hemicleus normandi* H. du Buyss; co-type (MNHN, Paris).

The published data are: Tunisia, le Kef sur les herbes sèches, en août (Dr Normand.)

***Hemicleus ordinatus* Fleutiaux**

*Hemicleus ordinatus* Fleutiaux, 1932b : 2.

LECTOTYPE (present designation). MOZAMBIQUE: ♂, Museum Paris, Zambeze, Nova Choupanga, Pres Chemba, P. Lesne; Janvier; *Hemicleus ordinatus* Fleut., type [Fleut.] (MNHN, Paris).

***Hemicleus quadricollis* Fleutiaux**

*Hemicleus quadricollis* Fleutiaux, 1919 : 12.

Holotype. KENYA: ♀, Afr. or. Ang. (Wa Kikuyu) Fort Hall, Alluaud & Jeannel, Janv. 1919, 1330 m st. 30; *Hemicleus quadricollis* Fleut., type [Fleut.] (MNHN, Paris).

***Hemicleus villiersi* Cobos**

*Hemicleus villiersi* Cobos, 1970 : 134; figs 1, 2.

Holotype. CONGO (BRAZZAVILLE): ♂, Congo, Sibiti, xi [sic] 1963; Museum Paris, Mission A. Descarpentries et A. Villiers, 1963-64; *Hemicleus villiersi* N. sp. Holotype [Cobos] (MNHN, Paris).

Paratype. 1 ♂, Sibiti, xii.63 (Cobos coll. Almeria, Spain). Not examined.

The published date is xii.63.

***Hemicleus weisei* Schwarz**

*Hemicleus weisei* Schwarz, 1898b : 183.

Syntype examined. TANZANIA: sex undetermined, Usamb. Weise; Coll Schwarz; Typus; weisei Schw. [Schwarz] (DEI, Eberswalde).

The published locality is Usambara.

**AGRYPNUS** Eschscholtz

*Agrypnus* Eschscholtz, 1829 : 32. Type-species: *Elater murinus* Linnaeus, by subsequent designation (Westwood, 1838: Synopsis, 26).

[*Lacon sensu* Germar, 1840 and subsequent authors, not Castelnau, 1836. Misinterpretation.]

*Mecynocanthus* Hope, 1837 : 53. Type-species: *Mecynocanthus unicolor* Hope, by monotypy.

**Syn. n.**

*Tylotarsus* Germar, 1840 : 247. Type-species: *Tylotarsus cinctipes* Germar, by monotypy.

**Syn. n.**

*Tilotarsus* Candèze, 1857 : 170. [Unjustified emendation.]

*Myrmodes* Candèze, 1857 : 168. Type-species: *Myrmodes akidiformis* Candèze, by monotypy.

**Syn. n.**

*Archontas* Goetzis, 1886 : 23. Type-species: *Elater murinus* Linnaeus, by monotypy.

*Pseudolacon* Blackburn, 1890 : 89. Type-species: *Pseudolacon rufus* Blackburn, by monotypy.

**Syn. n.**

*Homeolacon* Blackburn, 1890 : 90. Type-species: *Homeolacon gracilis* Blackburn, by monotypy.

**Syn. n.**

*Lobotarsus* Schwarz, 1898a : 131. Type-species: *Lobotarsus decoratus* Schwarz, by subsequent designation (Hyslop, 1921 : 263). **Syn. n.**

*Lobitarsus* Fleutiaux, 1935c : 93. [As a subgenus of *Tylotarsus*.] [Unjustified emendation.]

*Enoploderes* Schwarz, 1898a : 131. Type-species: *Elater (Conoderus) cuspidatus* Klug, by monotypy. [Junior homonym of *Enoploderes* Faldermann, 1837.]

*Centrostethus* Schwarz, 1898a : 414. [Replacement name for *Enoploderes* Schwarz.] **Syn. n.**

*Compsolacon* Reitter, 1905 : 6. Type-species: *Elater crenicollis* Ménétriers, by monotypy.

[Synonymized with *Lacon* auct. by Fleutiaux, 1918d : 198.]

*Paralacon* Reitter, 1905 : 6. Type-species: *Lacon cinnamomeus* Candèze, by monotypy.

[Reduced to subgenus of *Agrypnus* Eschscholtz, Ohira, 1968b : 364.] **Syn. n.**

*Neolacon* Miwa, 1929 : 235. Type-species: *Neolacon formosanus* Miwa, by monotypy. [Reduced to subgenus of *Compsolacon* Reitter, Miwa, 1934 : 14.] **Syn. n.**

*Colaulon* Arnett, 1952 : 116. Type-species: *Elater rectangularis* Say, 1925, by original designation. **Syn. n.**

*Cryptolacon* Nakane & Kishii, 1955 : 1. Type-species: *Cryptolacon myamoti* Nakane & Kishii, 1955, by original designation. [Reduced to subgenus of *Colaulon* by Kishii, 1961 : 25.]

**Syn. n.**

*Sabikikorius* Nakane & Kishii, 1955 : 3. [as subgenus of *Agrypnus* Eschscholtz]. Type-species: *Lacon fuliginosus* Candèze, 1865 : 10, by original designation. [Raised to generic status, Kishii, 1964 : 15.] **Syn. n.**

*Sagojyo* Kishii, 1964 : 30 [as a subgenus of *Colaulon* Arnett]. Type-species: *Colaulon (Sagojyo) yuppe* Kishii, by original designation. [Raised to generic status, Ohira, 1967b : 103.]

**Syn. n.**

*Sagojo* Ohira, 1968b : 364. [Unjustified emendation.]

*Archontoides* Cobos, 1966 : 651. Type-species: *Archontoides pretoriensis* Cobos by monotypy.

**Syn. n.**

*Pyrgranus* Golbach, 1968 : 198. Type-species: *Lacon tuspanensis* Candèze by original designation. **Syn. n.**

GENERIC DIAGNOSIS. Each tarsal claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum and mesepimeron do not form part of the margin of the mesocoxal cavity (Text-fig. 2). Second and third antennal segments small, subequal, each smaller than the fourth and following segments (Text-fig. 13). Antennal groove not extending beyond the anterior two-thirds of the prosternopleural suture; depth of groove variable. Vestiture scale-like, at least in part. Prothorax not constricted behind the anterior angles: lateral margin of prothorax carinate. Propleural grooves or depressions for the reception of the tarsi, if present, do not run parallel with the antennal grooves (Text-fig. 7).

Metasternal grooves or depressions for the reception of the tarsi, if present, directed diagonally across the metasternum so that the distal ends, if produced, would cut the lateral margin of the metasternum at a point within the posterior quarter of its length or run directly into the posterior lateral angles of the metasternum (Text-fig. 5). Scutellum variable in shape, but never with a longitudinal carina. Tarsi with or without ventral lobes (Text-figs 15, 16).

**RANGE OF VARIATION WITHIN THE GENUS.** Species possessing this combination of characteristics display a very wide range of variation in such features as the size and shape of the fourth to the eleventh antennal segments, the shape and appearance of the surface and margin of the head, prothorax and elytra, the shape of the mesosternal groove, the degree of development of the propleural and metasternal depressions or grooves for the accommodation of the anterior and middle tarsi, the length of the femora in relation to the width of the body, the structure of the tarsi and the colour and distribution of the scales clothing the body.

Up to the present time these characteristics have been used, either singly or in combination with one another, as the diagnostic features of genera and subgenera. The practice of studying restricted faunas has obscured the fact that, when considered on a world-wide basis, these characteristics are very variable and do not appear in any constant relationship to one another.

**HISTORY OF THE GENUS.** Eschscholtz listed the names of twelve species when he established the genus. Two species, *cribrosus* and *granulosus* were described as new and two others, *senegalensis* Dejean and *coenosus* Hope were undescribed. The description of *coenosus* Hope was not published until 1831 and *senegalensis* Dejean was eventually listed as a synonym of *notodonta* Latreille by Candèze (1857 : 27).

Latreille (1834 : 143) included six of Eschscholtz's *Agrypnus* species in his interpretation of the genus, which he divided into two parts. The first included species with a tubercle at the base of the prothorax (*E. fuscipes* Fabricius and *E. senegalensis* Dejean) and the second the species without a tubercle (*E. atomarius*, *varius*, *fasciatus* and *murinus*). He also included *quadrimaculatus* Fabricius (= *Betarmon ferrugineus* Scopoli) in the second group. The remaining six species included in *Agrypnus* by Eschscholtz (*tomentosus*, *luridus*, *coenosus*, *conspersus*, *cribrosus* and *granulosus*) are not mentioned by Latreille.

Germar (1840 : 253) included four (*luridus*, *tomentosus*, *fuscipes* and *atomaria*) of Eschscholtz's *Agrypnus* species in his interpretation of the genus and assigned to it four additional species (*notodonta* Latreille, *ruber* Perty, *moerens* n. sp. (*Alaus*, see p. 240) and *adspersus* Herbst (*Aliteus*, see p. 240)). Of Eschscholtz's remaining eight species he transferred *murinus* to *Lacon* and *varius*, *fasciatus* and *conspersus* to *Adelocera*. Germar does not refer to *coenosus*, *cribrosus*, *granulosus* or *senegalensis*.

Candèze (1857) limited the genus to four of the species originally included by Eschscholtz (*tomentosus*, *fuscipes*, *luridus* and *senegalensis*) to which he added 26 species bearing a very close resemblance to them.

Candèze's interpretation of *Agrypnus* (= *Lanelater* of the present work, see p. 240), containing relatively large species with long antennal grooves and clothed with fine setae, was generally accepted for over sixty years, and Hyslop's (1921 : 624) designation of *tomentosus* Fabricius as the type-species appeared perfectly justified. It was not until Lane drew Arnett's (1952 : 105) attention to the fact that Westwood

(1838 : 26) had properly designated *murinus* Linnaeus as the type-species of *Agrypnus* Eschscholtz that it became apparent that the correct interpretation of *Agrypnus* is entirely different from that of earlier workers.

NOTES ON THE GENERA AND SUBGENERA NEWLY PLACED IN SYNONYMY WITH *Agrypnus*.

*Mecynocanthus* Hope. *M. unicolor* Hope, the type-species of this monobasic genus is discussed on p. 225. Apart from the locality ('India oriental'), which is probably erroneous, this species does not differ significantly from *Centrostethus cuspidatus* (Klug) (see below).

*Tylotarsus* Germar. The genus was erected for *cinctipes*, a Madagascan species with lobed fourth tarsal segments. Schwarz (1898a : 129) redefined the genus, restricting it to species with lobed fourth tarsal segments in which the margins of the mesosternal groove are horizontal posteriorly and steeply declivous anteriorly and the anterior angles of the prothorax produced but not sharply pointed as in *Centrostethus*. Examination of the Madagascan material available has shown that development of the anterior angles of the prothorax varies from one species to another and bears no constant relationship to the shape of the mesosternal groove. Schwarz (1903a : 359) comments that the shape of the mesosternal groove of *T. angularis* Schwarz lies between that found in the type-species of *Tylotarsus* and *Lobotarsus*.

*Myrmodes* Candèze. The genus is characterized by the sloping humeri of the elytra. This characteristic is associated with the reduction in length of the wings and is found, though in a less extreme form, in the Australian *Agrypnus octavus* (Candèze) and the South African *Agrypnus pretoriensis* (Cobos) (= *paenulatus* Boheman)). The latter species was used as a basis for the erection of the genus *Archontoides*. In each case reduction of the humeri is accompanied by a reduction in length of the metasternum and the scutellum. Other transitional forms between *Agrypnus* and *Myrmodes* are known. In certain South African (e.g. *muscerda* (Candèze)) and Australian (e.g. *divaricatus* (Candèze)) species, the wings, metasternum and scutellum are reduced in length, but the humeri are normal.

*Pseudolacon* Blackburn. The genus was erected for *rufus* Blackburn which differs from *Lacon* sensu auctt. (*Agrypnus* of this work) in that the body is more cylindrical and the first four tarsal segments conical. Both characteristics are too variable to justify the retention of the genus.

*Homeolacon* Blackburn. The diagnostic features of this genus are the strongly transverse fourth to eleventh antennal segments and elongate tarsal segments. The lectotype of *gracilis* Blackburn, the only specimen known to me, is a male. It bears a close resemblance to *Agrypnus cylindricus* (Candèze), (= *truncatus* (Herbst)) an Indian species in which the antennal segments of the male are very much more transverse and the tarsi more elongate, than those of the female. It seems very probable that the female of *gracilis* Blackburn, will be found to possess the moderately serrate antennae found in the majority of *Agrypnus* species.

*Lobotarsus* Schwarz. The genus was erected for species differing from *Tylotarsus* in that the margin of the mesosternal groove is inclined and not angled. Schwarz (1903a : 359) himself cast doubt on the value of this character when he drew attention to the fact that the appearance of the margin of the mesosternal groove of *T. angularis* Schwarz was intermediate between that found in *Tylotarsus* and *Lobotarsus*. Fleutiaux clearly had misgivings concerning the genus. In 1935c he treated *Lobitarsus* [sic] as a subgenus of *Tylotarsus*. In 1941 he restored it to generic status, redefining it on the basis of the shape of, and presence of tubercles on, the prothorax.

*Centrostethus* Schwarz was proposed as a new name for *Enoploderes* Schwarz, 1898, preoccupied by the Cerambycid genus *Enoploderes* Faldermann, 1837. The type-species *cuspidatus* Klug is distinguished from *A. murinus* (Linnaeus) only by the lobed tarsi and sharply pointed anterior angles of the prothorax.

*Compsolacon* Reitter. The genus is characterized by the crenulate lateral margins of the prothorax. This characteristic is known to vary intraspecifically and also on the two sides of the same individual. Fleutiaux (1918d : 198) placed the genus in synonymy with his interpretation of *Lacon* (= *Agrypnus* of the present work). Since that time there has been little agreement concerning the status of *Compsolacon*. In the most recent work, that of Van Zwaluwenburg (1966 : 298), *Compsolacon* is reduced to a subgenus of his interpretation of *Adelocera* Latrielle, which corresponds to *Agrypnus* Eschscholtz of the present work.

*Paralacon* Reitter. Reitter erected this genus for his interpretation of *Lacon cinnamomeus* Candèze, which was probably correct. In this species the posterior femora are elongate, so that the femoro-tibial articulations are visible from above when the beetle is at rest. This characteristic is developed to a greater or less degree in a number of species which in all other respects bear a close resemblance to one another.

*Neolacon* Miwa. The genus was established for three species, *formosanus* Miwa, *cervinus* Erichson, *sinensis* Candèze 'and probably others' in which the lateral carina of the prothorax almost attains the anterior margin. The length of this carina, which arises at, or just anterior to the posterior angles of the prothorax, has been found to vary considerably both intra-specifically and on the two sides of the same individual. Five years after establishing *Neolacon*, Miwa (1934 : 14) placed it in synonymy with *Compsolacon* (q.v.).

*Colaulon* Arnett. The genus was erected for those Nearctic species 'which have hitherto been placed in the genus *Lacon* [auctt. = *Agrypnus* as defined in this work], but which differ from the type-species *murinus* Linnaeus, in that the scaly vestiture is sparse, coarse and not coloured and forms regular rows on the elytra and in which the lateral margin of the prothorax is denticulate'. Since these characteristics are in my opinion of no value at the generic level (see p. 114), and as all the *Colaulon* species known to me possess the diagnostic characteristics of *Agrypnus* the genus is here treated as a synonym of *Agrypnus*.

*Cryptolacon* Nakane & Kishii. The genus was erected for species differing from

*Compsolacon* by the absence of a carina on the posterior angles of the prothorax and from *Colaulon* by the absence of tarsal grooves on the propleurae. Kishii (1961 : 25) reduced *Cryptolacon* to a subgenus of *Colaulon* (q.v.).

*Sabikikoreus* Nakane & Kishii. This subgenus of *Agrypnus* was erected on the basis of a number of variable characteristics including the shape of the body, the presence of tubercles on the pronotum, the propleural tarsal grooves, the lateral carinae of the prothorax and the appearance of the terminal abdominal sternite (see below). Kishii (1964 : 15) raised *Sabikikoreus* to generic status.

*Sagojyo* Kishii. The type-species *yuppe* Kishii possesses all the diagnostic characters of *Agrypnus*. It differs from the type-species, *murinus* (Linnaeus) only by such very variable features as the shape of the body, the presence of tarsal grooves and the presence of nodules on the pronotum.

Ohira, 1968b : 364 and 1969a : 93 uses the erroneous spelling *Sagojo*.

*Archontoides* Cobos. The diagnostic characteristic, the sloping humeri, is associated with the reduction of the wings. The metasternum and scutellum are also reduced in length. See also *Myrmodes*, p. 115.

*Pyrgranus* Golbach. The genus was established for eight Central American species differing from *Colaulon* in that the lateral margins of the prothorax are not crenate. The type-species *tuspanensis* possesses all the generic characteristics of *Agrypnus* and differs from the type-species *murinus* Linnaeus only in the colour and arrangement of the scales clothing the body, a character which is of importance only at the specific level. It is of interest that in two of the species included in *Pyrgranus* by Golbach (*paleatus* Champion and *scarrosus* Candèze) the lateral margins of the prothorax are distinctly crenate. *L. dubius* Candèze, another species included in the new genus by Golbach, is not congeneric with the remaining species. It is a true *Lacon* species.

**SEXUAL DIMORPHISM.** In a large number of species it is impossible to distinguish the sexes by external characteristics. However the present investigation has shown that the males and females of certain species display differences in the appearance of one or more of the last three visible abdominal sternites and that in other species the sexes can be separated on the structure of the antennae or tarsi.

Candèze (1874 : 43) was the first to record that in the female of certain species, the central area of the last visible abdominal sternite is smooth, whereas in the male the entire surface is punctured. Champion (1894 : 263) appears to have been unaware of Candèze's discovery because he states that the smooth patch is typical of the male. Lewis (1896 : 336) accepted Champion's statement. That this did not originate from a printer's error is shown by the fact that all the specimens in the BMNH labelled as males by Champion and Lewis are females and vice-versa. This type of sexual dimorphism is not found in all species, and does not occur in any Australian species.

The appearance of the surface of last visible sternite varies greatly from one species to another but it is constant within a species. The form of the differentiated area, where it occurs, ranges from a slightly raised patch with a well defined outline

and polished surface without any large punctures through all the intermediate stages to an ill-defined area in which the punctures are only very slightly less dense than on the rest of the underside. Species in which the females display this characteristic to a greater or lesser degree occur in the Palaearctic (e.g. *murinus* (Linnaeus), *cinnamomeus* (Candèze)), Oriental (e.g. *binodulus* (Motschulsky), *setiger* (Bates), *hispidulus* (Candèze)), Ethiopian (e.g. *foedus* (Candèze)) and Madagascan regions (e.g. *vestitus* Klug, *cinctipes* (Candèze)) and in North America (e.g. *rectangularis* (Say)) and Central America (e.g. *paleatus* (Champion)). The Northern Indian *lutosus* (Candèze) is unusual in that both the fourth and fifth visible abdominal sternites bear a polished patch in the mid line. The Madagascan species *sinuatus* (Candèze) differs from all other species known to me in that the last visible abdominal sternite of the female bears a single enlarged raised puncture from which a number of short slender scales arise. In appearance this raised puncture resembles those found on the fourth visible abdominal sternite of certain Australian species.

Australian *Agrypnus* species differ from those from other regions in that the modified areas, where they occur, lie on the fourth, and in one species also on the third, visible abdominal sternite. A large raised area with a number of punctures is found in some species such as *ursulus* (Candèze) and *laticollis* (Candèze). The polished area is smaller but much more strongly raised and bears only two or three punctures in *stigmiosus* (Blackburn) and *poriginosus* (Candèze). A single large raised puncture, from which several short narrow scales arise, occurs in a number of species including *punctipennis* (Candèze) and *marmoratus* (Candèze). A large single puncture of this kind is present on both the third and fourth visible abdominal sternite of *adustus* (Elston). The function of these pores and patches is unknown.

The antennae of the male are considerably larger and more strongly serrate than those of the female in the Indian *truncatus* (Herbst) and probably also the Australian *gracilis* (Blackburn) of which only the male is known.

Sexual dimorphism of the tarsal segments is known in only one species, *obscurus* Fleutiaux from Africa (= *abstrusus* see p. 120). In this species the fourth tarsal segment of the male is distinctly lobed while that of the female is only obliquely truncate.

**DISTRIBUTION.** *Agrypnus* species have been recorded from all parts of the world except South America. The largest number of species has been described from the Oriental and Australian regions.

**BIOLOGY AND HABITS.** Hardly anything has been published on the habits of the adult beetles. *Agrypnus murinus* (Linnaeus) is generally recorded as living under stones and in the ground. A number of species have been taken from the foliage of sandal (Fleutiaux, 1933 : 1). *A. eucalypti* (Blackburn) was found under the bark of *Eucalyptus*. Specimens in collections have provided no information other than having been taken by sweeping, beating or in light traps. Fleutiaux (1944 : 148) records that *Compsolacon* species were found together with *Octocryptus coomani* near lakes and rivers and in damp places.

A great deal has been written on the Elaterid 'clicking' mechanism and the part

this ability to jump when turned on their backs plays in the life of the beetles. According to Horion (1949 : 118) *murinus*, when turned on its back, refuses to right itself in the accepted Elaterid fashion but defends itself by everting the paired [? stink] glands lying near the tip of the abdomen. I have found no descriptions of the behaviour of other *Agrypnus* species under similar circumstances.

The larvae of a number of species, including *murinus* have been described and figured. They live in the ground and in so far as is known they are carnivorous though some (e.g. *murinus*) may feed on roots. Van Emden (1945) and Ohira (1962) contain useful bibliographies of works on Elaterid larvae.

### THE SPECIES INCLUDED IN THE GENUS *AGRYPNUS*

The majority of species now assigned to the genus were described at the time when *murinus* Linnaeus was believed to be a typical representative, or later the type-species, of the genus *Lacon* and are listed under this generic name in the Schenkling catalogue. After Fleutiaux's (1926) correction of the catalogue, a number of species were described as *Adelocera*. The following 409 species known to me are now assigned to *Agrypnus*.

#### *Agrypnus aberdarensis* (Fleutiaux) **comb. n.**

*Adelocera* (*Archontas*) *aberdarensis* Fleutiaux, 1935b : 199.

LECTOTYPE (present designation). KENYA: ♀, Kenya, Mais. Forest, Kinangop, Mts. Aberdare, vers ouest. 2,600 m; Mission de l'Omo, C. Arambourg, P.-A. Chappius, R. Jeannel 1932-33; *aberdarensis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 22 ex., same locality as lectotype, one with Fleutiaux's determination label (MNHN, Paris). 1 ♀, same locality as lectotype, with Fleutiaux's determination label (BMNH). 1 ex., Elgeyo escarpment, 2500 m, with Fleutiaux's determination label (MNHN, Paris). 1 ex., Kikuyu escarpment, 2300 m, without determination label (MNHN, Paris).

#### *Agrypnus abreptus* (Candèze) **comb. n.**

*Lacon abreptus* Candèze, 1893e : 170.

*Adelocera abreptus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on unrecorded number of specimens from Kanara, Belgaum and S. Bombay [India] in the Andrewes collection. Selection of a lectotype has been postponed until any material extant in the Candèze collection in the IRSNB, Brussels has been examined.

Syntypes examined. INDIA: 1 ♀, co-type, Belgaum P.; *Lacon abreptus* Cand. 1 ♂, cotype; Belgaum P.; Andrewes Bequest, 1922 : 221. 1 ♀, co-type; Belgaum P.; 269; *Lacon abreptus* Cd., Andrewes Bequest, 1922 : 221, 1 ♀; Belgaum N.; Andrewes Bequest, 1922 : 221. (BMNH).

***Agrypnus abstrusus* nom. n.**

*Tylotarsus* (*Lobitarsus*) [sic] *obscurus* Fleutiaux, 1935c : 94.

*Agrypnus obscurus* (Fleutiaux) **comb. n.** [Junior secondary homonym of *Agrypnus obscurus* (Fleutiaux, 1934b).]

LECTOTYPE (present designation). ♂, Kalimapeza [position unknown] fevrier (MacArthur); *Tylotarsus obscurus* Fleut. [Fleut.] (MNHN, Paris).

Paralectotype. KENYA: ♂, Brit. E. Africa, S. Masai Res., 10.iv.1913, T. J. Anderson; *Tylotarsus obscurus* Fleut. [Fleut.]; Pres. by Imp. Inst. Ent., B.M. 1935 : 95. (BMNH).

Additional material examined. UGANDA: 3 ♂, 4 ♀, Gulu, IV-V. 1925 (G. D. H. Carpenter) (BMNH).

This species is unusual in that the fourth tarsal segment of the male is lobed, while that of the female is obliquely truncate.

***Agrypnus acerbus* (Candèze) comb. n.**

*Lacon acerbus* Candèze, 1888 : 670.

*Adelocera acerbus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. Bhamo, BURMA collected by Fea. MCSN, Genoa.

The generic attribution is based on the description.

***Agrypnus acervatus* (Candèze) comb. n.**

*Lacon acervatus* Candèze, 1888 : 670.

*Adelocera acervatus* (Candèze) Fleutiaux, 1926 : 96.

Syntypes: 2 ex., Plapoo [position unknown], Tenasserim april (Fea). ?MCSN, Genoa.

The generic attribution is based on the following specimens; BURMA: 2 ♀, Carin Cheba [see p. 275] v.88 (L. Fea), one bearing Candèze's determination label [Candèze's 1891 : 774 locality] (BMNH). 1 ♂, 1 ♀ same locality both with Candèze's determination labels (MNHN, Paris).

***Agrypnus aculeatus* (Candèze) comb. n.**

*Tilotarsus* [sic] *aculeatus* Candèze, 1857 : 178.

*Centrosethus aculeatus* (Candèze) Schwarz, 1898c : 414.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar; Janson coll., 1903 : 130; *aculeatus* [Candèze label stuck to the underside of Janson's]; *Tilotarsus aculeatus* Cdze., type ex. coll. de Laferté [Janson] (BMNH).

***Agrypnus acuminipennis* (Fairmaire) comb. n.**

*Lacon acuminipennis* Fairmaire, 1878 : 109.

*Adelocera acuminipennis* (Fairmaire) Fleutiaux, 1926 : 96.

Type-locality. CENTRAL CHINA, collected by Abbé David. Present location of material unknown.

The generic attribution is based on the following specimens; 1 ♀, Museum Paris, Moupin; *Lacon acuminipennis* Fairm. [unknown mss.]; *costicollis* Cand., *acuminipennis* Fairm. [Fleut.]; Type. 1 ♀, same locality without determination labels (MNHN, Paris). These specimens may be part of the syntype-series. The synonymy with *costicollis* Candèze (Fleutiaux, 1962 : 96) has not been confirmed.

***Agrypnus acutangulus* (Fleutiaux) comb. n.**

*Compsolacon acutangulus* Fleutiaux, 1934a : 15.

LECTOTYPE (present designation). CHINA: ♂, Tchoung-King, Sze Tchouan [Chung King, Szechwan]; *Compsolacon acutangulus* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. CHINA: S. Kansu, 28.ix.30 (NR, Stockholm). Not examined.

***Agrypnus adelaidae* (Blackburn) sp. rev.**

*Lacon adelaidae* Blackburn, 1891a : 505.

LECTOTYPE (present designation): AUSTRALIA: ♂, 1948 T [on card mount, see p. 270]. Australia, Blackburn coll.; *Lacon adelaidae* Blackb., [Blackb.] (BMNH). Comparison of the lectotypes has shown that Elston's (1924 : 197) synonymy with *carinulatus* Candèze is not justified.

***Agrypnus adeloceroides* (Candèze) comb. n.**

*Tilotarsus* [sic] *adeloceroides* Candèze, 1900 : 79 (3).

*Lobotarsus adeloceroides* (Candèze) Schwarz, 1906 : 30.

The description is based on an unrecorded number of specimens from 'Congo français Benito' [EQUATORIAL GUINEA].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimens, 2 ex., Benito, Congo Franc., determined by Fleutiaux (MNHN, Paris). These specimens may be part of the syntype series.

***Agrypnus adustus* (Elston) comb. n.**

*Lacon adustus* Elston, 1924 : 205.

*Lacon adustus* Elston, Neboiss, 1956 : 4.

The description is based on an unrecorded number of specimens from AUSTRALIA: Queensland; Cairns (*A. M. Lea*), Coen River, Stewart River (*W. D. Dodd*), Townsville (*N. B. Tindale*), Malanda (*Dr E. Mjöberg*).

Syntype-material (see p. 274): SAM, Adelaide, AM, Sydney, MNV, Melbourne. Not examined.

The generic attribution is based on a syntype ♀: Cairns; *Lacon adustus* Elston, co-type (SAM, Adelaide).

***Agrypnus aequalis* (Candèze) comb. n.**

*Lacon aequalis* Candèze, 1900 : 78.

*Adelocera aequalis* (Candèze) Fleutiaux, 1926 : 96.

Holotype. INDIA: ♂, Kashmir; 902; *Lacon aequalis* Cand., type [?Cand.]; Andrewes Bequest, 1922-221 (BMNH).

***Agrypnus afflictus* (Candèze) comb. n.**

*Lacon afflictus* Candèze, 1874 : 68.

*Adelocera afflictus* (Candèze) Fleutiaux, 1926 : 98.

The description is based on an unrecorded number of specimens from Malacca and Siam in the Janson and Candèze collections. The Candèze collection in the IRSNB, Brussels does not contain any specimens from these localities. The only specimen in that collection with a Candèze determination label is from Borneo. It is not conspecific with the lectotype designated below. The BMNH collection also does not contain specimens from the published localities. The only specimen with Candèze determination label is from Penang. However since this specimen agrees well with the description and as, during the last century, Malacca was sometimes used as an alternative name for Malaya I believe that the following lectotype designation is justified.

LECTOTYPE (present designation). MALAYA: ♀, Penang [Janson]; Janson coll. 1903.130; *afflictus* Cdz. [Cand.]; *Lacon afflictus* Cand. co-type [Gahan] (BMNH).

***Agrypnus akidiformis* (Candèze) comb. n.**

*Myrmodes akidiformis* Candèze, 1857 : 169.

Holotype. AUSTRALIA: ♂, Nov. Holl. Raffles Bay; Janson coll. 1903.130; *akidiformis* Cdze. Type ex. coll. de Laferte [Janson]; *Myrmodes akidiformis* Cdz., Type [Cand.] (BMNH).

***Agrypnus alberti* nom. n.**

*Tylotarsus mocquerysi* Fleutiaux, 1934b : 59.

*Agrypnus mocquerysi* (Fleutiaux) **comb. n.** [Junior secondary homonym of *Agrypnus mocquerysi* (Fleutiaux, 1932).]

LECTOTYPE (present designation). MADAGASCAR: ♀, Madagascar, Baie d'Antongil, A. Mocquerys; *mocquerysi* Fleut, type [Fleut.] (MNH, Paris).

***Agrypnus albisparsus* (Candèze) comb. n.**

*Tilotarsus* [sic] *albisparsus* Candèze, 1857 : 174.

Syntypes examined. MADASCAR: 1 ♂, Latimell Ch. Mad. [illegible manuscript]; *albisparsus* Cand., Type [Fleut.]. The specimen stands over a Chevrolat collection label; *Tilotarsus albisparsus* Cand., type Mon. 1, 1857 p. 174, 4. Madagascar (MNHN, Paris). 1 ♂, Madagascar, Janson coll. 1903.130; *Tilotarsus albisparsus* Cdz. Madag. [Cand.]; *Tylotarsus albisparsus* Cdze., ex. coll. Candèze [Janson] (BMNH). 3 ♂, Madagascar; Janson coll. 1903.130; *Tilotarsus albisparsus* Cdz. ex. coll. de Laferté [Janson]. One specimen bears the word 'Type' on Janson's determination label (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

The designation of a lectotype has been postponed until the specimen in the MNHU, Berlin, mentioned by Candèze has been examined.

***Agrypnus albitactus* (Candèze) comb. n.**

*Lacon albitactus* Candèze, 1874 : 55.

*Adelocera albitactus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). NIGERIA: ♂, Old Calabar; Janson coll. 1903.130; *albitactus* [Cand.]; *Lacon albitactus* Cand., Old Calabar [Gahan] (BMNH).

***Agrypnus albomaculatus* (Miwa) comb. n.**

*Lacon albomaculatus* Miwa, 1934 : 68, pl. 1, fig. 7.

Type-material. JAPAN: Honshiu, Gifu, vii, 1914 (Y. Miwa). Neither the number of specimens or their location is recorded. ? Taiwan Agricultural Research Institute, Taipei.

The generic attribution is based on the description.

***Agrypnus albopictus* (Candèze) comb. n.**

*Lacon albopictus* Candèze, 1857 : 104.

*Adelocera albopictus* (Candèze) Fleutiaux, 1926 : 98.

LECTOTYPE (present designation). MADAGASCAR: ♂, Dej. Madagascar [Janson]; Janson coll. 1903.130; *Lacon albopictus* Cdze., Cand. [Janson]; *Agrypnus albopictus* Dej. cat e coll. Dejean [Janson] (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276).

Paralectotypes. 1 ♂, 2 ♀ with the same labels as the type (BMNH). The determination label on one female bears the word 'type' but no type-designation has been published. 1 ♀, 16102 [MNHU, Berlin catalogue number, refers to locality and collector on following label]; Madagascar Goud.; *albopictus* Cand., Madag., Goudot [Gerstaecker]. 3♂, Madagascar, Goud. no. 16102 (MNHU, Berlin). The absence of Candèze's determination label is probably due to Gerstaecker (see p. 275).

***Agrypnus alboscutatus* (Candèze) comb. n.**

*Lacon alboscutatus* Candèze, 1893b : 8.

*Adelocera alboscutatus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: 1 ex, St Maria de Madagascar; *alboscutatus* Cand., comparé au type [Fleut.] (MNHN, Paris).

***Agrypnus alluaudi* (Fleutiaux) comb. n.**

*Centrosthus alluaudi* Fleutiaux, 1934b : 61.

LECTOTYPE (present designation). MADAGASCAR: ♀, Madagascar, Forêt Tanala, Alluaud, 1901; Museum Paris, Madagascar, Coll. Ch. Alluaud; *Centrostethus alluaudi* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus alternatus* (Schwarz) comb. n.**

*Lacon alternatus* Schwarz, 1902a : 311.

*Adelocera alternatus* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from NEW GUINEA, Astrolabe Gebirge.

Type material: ?DEI, Eberswalde.

The generic attribution is based on Schwarz's comment that the species shows a similarity to *wallacei* Candèze.

***Agrypnus amplicollis* (Boheman) comb. n.**

*Lacon amplicollis* Boheman, 1851 : 414.

*Adelocera amplicollis* (Boheman) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). SOUTH AFRICA: ♂, Caffraria; J. Wahlb.; Type; *amplicollis* Boh. [Boh.] (NR, Stockholm).

Paralectotypes. 3 ♀, Caffraria; J. Wahlb. (NR, Stockholm).

The published locality is 'Habitat in tractibus fluvii Gariepis'. The discrepancy between the published locality and the label on the specimen is discussed on p. 280.

Candèze (1857 : 161) states that *Agrypnus granulosus* Eschscholtz (1829 : 32) may be conspecific with *amplicollis* Boheman. This has not been confirmed. The description of *Agrypnus granulosus* is based on an unrecorded number of specimens discovered by Westermann in 'Cap. b. sq. [sic]'. The type-material has not been located. For the history of the Eschscholtz collection see p. 274.

***Agrypnus andersoni* (Blackburn) comb. n.**

*Lacon andersoni* Blackburn, 1891 : 508.

*Lacon andersoni* Blackburn; Neboiss, 1956 : 4.

LECTOTYPE (present designation). AUSTRALIA: ♂, 644T [on card mount, see p. 270]; Australia, Blackburn Coll.; *Lacon andersoni* Blackb. [Blackb.] (BMNH).

The published locality is S. Australia, near Port Lincoln.

***Agrypnus angularis* (Schwarz) comb. n.**

*Tilotarsus angularis* Schwarz, 1903a : 359

The description is based on an unrecorded number of specimens from Madagascar. Syntype-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen; MADAGASCAR; 1 ex., *Tilotarsus angularis* Schw. Det. par l'auteur. Madag. (MNHN, Paris).

***Agrypnus angulicollis* (Candèze) comb. n.**

*Lacon angulicollis* Candèze, 1891b : 243.

*Adelocera (Compsolacon) angulicollis* (Candèze); Van Zwaluwenburg, 1959 : 352.

Lectotype (designated by Van Zwaluwenburg, 1959 : 352) JAVA: pass (Peontjak) between Buitenzorg and Preanger, W. Java (Pasteur); Candèze identification label (RNH, Leiden). Not examined.

Paralectotypes: 2 ex, same locality as the lectotype (RNH, Leiden).

The description is based on three specimens collected by M. J. D. Pasteur in western Java. Candèze also records that he possessed a large number of specimens collected in the eastern part of the island. These may be the ones recorded as being labelled 'Ex Typis' by Van Zwaluwenburg.

***Agrypnus angusta* (Fleutiaux) comb. n.**

*Adelocera angusta* Fleutiaux, 1942 : 1.

LECTOTYPE (present designation). BURMA: ♂, N. E. Burma, Kambaiti, 2000 m., 13/5.1934, R. Malaise; *Adelocera angustata* Fleut., co-type [Fleut.] (MNHN, Paris).

The description is based on an unrecorded number of specimens collected by the Swedish expedition to Burma and British India in 1934.

***Agrypnus antiquus* (Candèze) comb. n.**

*Lacon antiquus* Candèze, 1857 : 100.

*Adelocera antiquus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♀, 1609I [museum catalogue number, refers to locality and collector on following label]; Madagascar, Goudot;

antiguus Cand. Madag. Goud. [Gerstaecker] (MNHU, Berlin). The absence of Candèze's determination label is probably due to Gerstaecker (see p. 275).

Paralectotypes: 2 ♂, Madagascar, Goud. Nr. 16091 (MNHU, Berlin). 1 ♀, Lap. Madagascar; Janson coll. 1903.130; Lacon antiguus Cdze. Cand., Type e coll de Laferté [Janson]; globicollis Gory Madag. [? la Ferté Sénectère] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Agrypnus apodixus* (Candèze) comb. n.**

*Lacon apodixus* Candèze, 1865 : 9.

*Adelocera apodixus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). PHILIPPINES: ♀, Luzon [Janson]; 394; Janson coll. ex Candèze, 1903.130; Lacon apodixus Cdze. Type (ex. coll. Cand.) [Janson] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

***Agrypnus applanatus* (Elston) comb. n.**

*Lacon applanatus* Elston, 1924 : 206.

*Lacon applanatus* Elston; Neboiss, 1956 : 4.

The description is based on an unrecorded number of specimens from WESTERN AUSTRALIA.

Syntype-material (see p. 274): AM, Sydney, SAM, Adelaide, NMV, Melbourne.

The generic attribution is based on the following syntypes: 2 ♀ on one card, W. Australia, Note Book 318: co-type (SAM, Adelaide).

***Agrypnus arbitrarius* (Elston) comb. n.**

*Lacon arbitrarius* Elston, 1924 : 208.

*Lacon arbitrarius* Elston; Neboiss, 1956 : 5.

The description is based on an unrecorded number of specimens from NORTH-WEST AUSTRALIA: Derby, Kimberley district (Dr E. Mjöberg).

Syntype-material (see p. 274): AM, Sydney, SAM, Adelaide.

Generic attribution is based on a syntype ♂ bearing a co-type label (SAM, Adelaide).

***Agrypnus arctior* (Candèze) comb. n.**

*Lacon arctior* Candèze, 1895b : 56.

*Adelocera arctior* (Candèze) Fleutiaux, 1926 : 96.

Holotype. MADAGASCAR: ♀, Madagascar, Diego Suarez 17, Ch. Alluaud 1893; Museum Paris, Madagascar, Coll. Ch. Alluaud; Type; Lacon arctior Cand. n. sp. [Cand.]; Cand. det. [Fleut.] (MNHN, Paris).

*Agrypnus arenicola* Nakane & Kishii

*Agrypnus* (*Sabikikorius*) *arenicola* Nakane & Kishii, 1955 : 3, pl. 2, figs 4, 5.

Holotype. JAPAN: ♀, Takarajima, 29.v.1953, S. Ueno leg. Osaka Mus. Nat. Hist. Not examined. The generic attribution is based on the description.

*Agrypnus argentatus* (Candèze) **comb. n.**

*Lacon argentatus* Candèze, 1893b : 7.

*Adelocera argentatus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR; Antananarivo.

Syntype-material: ?IRSNB, Brussels.

Generic attribution based on Candèze's comment that the species resembles a small *turbidus* Germar (see p. 224).

*Agrypnus argillaceus* (Solsky) **comb. n.**

*Lacon argillaceus* Solsky, 1871 : 360.

*Archontas argillaceus* (Solsky) Fleutiaux, 1947 : 280.

The description was based on material collected in Vladivostock in July by R. Maak and acquired by Solsky. This material has not been located.

The generic attribution is based on material under this name in the BMNH and MNHN, Paris. This material includes several different species bearing a close resemblance to one another.

*Agrypnus aristatus* (Champion) **comb. n.**

*Lacon aristatus* Champion, 1894 : 267.

*Pyrganus aristatum* (Champion) Golbach, 1968 : 198.

Syntype-material: 26 specimens bearing the characteristic part printed, part Champion manuscript determination labels: B.C.A. Coll. III (1), *Lacon aristatus* Ch. MEXICO: 1 ♂, Laf. Vera Cruz, Mex.; *Lacon lezeleucei* Cand., Cand. e coll. de Laferté [Janson]. 1 ♀, GUATEMALA; Coll. Janson. 3 ♀, COSTA RICA; Caché H. Rogers (BMNH). 1 ex., same locality (MNHN, Paris). 1 ♂, Costa Rica, Van Patten. 1 ♀, Costa Rica; Janson, ex Deyrolle; *Lacon lezeleucei* [Champ.]. PANAMA: 2 ♂, 10 ♀, V. de Chiriqui, 2-3000ft. Champion (BMNH). 2 ex., same locality (MNHN, Paris). 2 ♂, 2 ♀, Bugata, 800-1500 ft. Champion (BMNH).

Despite the fact that it bears the same labels as the lectotype of *lezeleucii* Candèze. I do not believe that the specimen recorded above labelled *lezeleucii* Cand. by Janson is part of the original syntype series of that species. The specimen differs from the description of *lezeleucii* in several ways including the appearance of the scales, which are narrow and hair-like, and the posterior angles of the prothorax which are right-angled and sharp instead of turned outwards and truncate. The

other specimen labeled *lezeleucii* was probably misidentified by Champion before he described *aristatus*.

The designation of the lectotype is postponed until the material can be studied in greater detail.

***Agrypnus armatus* (Candèze) comb. n.**

*Tilotarsus* [sic] *armatus* Candèze, 1889 : 75 (8).

LECTOTYPE (present designation). MADAGASCAR: ♂, Museum Paris, Madagascar, Goudot 1834; 4177/34; *Tilotarsus armatus* Cand., type 89 [Cand.] (MNHN, Paris).

***Agrypnus asper* (Candèze) comb. n.**

*Lacon asper* Candèze, 1874 : 55.

*Adelocera asper* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). W. AFRICA: ♀, Niger source [Janson]; Janson coll. 1903 : 130; *Lacon asper* Cand., type, Niger source [Gahan]; *asper* [Cand.] (BMNH).

Paralectotypes: 2 ♀, Niger source; Janson coll. 1903 : 130; *Lacon asper* Cand. [Gahan] (BMNH).

The published locality is 'Guinée, Bouches du Niger (Coll. Janson)'. It seems probable that the discrepancy between the published and label localities arose when Janson relabelled the specimens.

***Agrypnus asperulatus* (Candèze) comb. n.**

*Lacon asperulatus* Candèze, 1878a : 103.

*Adelocera (Compsolacon) asperulata* (Candèze); Van Zwaluwenburg, 1959 : 352.

Lectotype (designated by Van Zwaluwenburg, 1959 : 352). NEW GUINEA: New Guinea, Isola Yule (*D'Albertis*) (MCSN, Genoa). Not examined.

Paralectotypes. 9 ex., standing beside lectotype (Van Zwaluwenburg, loc. cit.) (MCSN, Genoa); Not examined. 4 ex., N. Guinea, Isola Yule, T.F.v. 1875; L. M. D'Albertis; *Lacon asperulatus* Cand. [unknown mss.] (MNHN, Paris). 4 ex., same locality, one specimen with Fleutiaux's determination label and another label Ann. Mus. civ. Genoa 1878 p. 103. [Fleut.]. 2 ex., same locality with date iv.1875: 2 ex., same locality with date vi.1875 (MNHN, Paris).

***Lacon assus* (Candèze) comb. n.**

*Lacon assus* Candèze, 1857 : 145.

*Lacon assus* Candèze; Neboiss, 1955 : 5.

LECTOTYPE (present designation). AUSTRALIA: sex undetermined, Nov. Hollandia; Janson coll. ex Candèze, 1903.130; *Lacon assus* Cdz. N. Holl. [Cand.]; Type ex coll. Candèze [Gahan] (BMNH). The abdomen is missing.

***Agrypnus badeni* (Candèze) comb. n.**

*Lacon badeni* Candèze, 1878b : LIII(7).

*Adelocera badeni* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR.

Syntype-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: 1 ex. Ihosy, Madagasc.; *Adelocera badeni* Cand. (*Lacon*) [Fleut.] (BMNH.).

***Agrypnus baibaranus* nom. n.**

*Neolacon formosanus* Miwa, 1929 : 235; fig. 2.

*Agrypnus formosanus* (Miwa) **comb. n.** [Junior secondary homonym of *Agrypnus formosanus* (Bates, 1886).]

The description is based on an unrecorded number of specimens from FORMOSA, Baibara.

Type-material: ?Taiwan Agricultural Research Institute, Taipei.

The generic attribution is based on the description.

***Agrypnus bakeri* (Fleutiaux) comb. n.**

*Lacon bakeri* Fleutiaux, 1916 : 219.

LECTOTYPE (present designation). PHILIPPINES: ♀, Butuan, Mindanao, Baker; *Lacon bakeri* Fleut., type, J. Sc. Phil. 1916 : 219 [Fleut.] (MNHN, Paris).

***Agrypnus basalis* (Fleutiaux) comb. n.**

*Adelocera (Archontas) basalis* Fleutiaux, 1935b : 200.

LECTOTYPE (present designation). KENYA: ♀, Kenya, Mais. forest. Kinangop Mt. Aberdare vers ouest, 2,600 m.; Museum Paris, Mission de L'Omo, C. Arambourg, P. A. Chappuis, R. Jeannel, 1932-33; *basalis* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes. 7 ex., same locality as lectotype, two with Fleutiaux's determination label (MNHN, Paris). 1 ♀, same locality was lectotype, determined by Fleutiaux (BMNH). 1 ex., Plateau de Uasin Gishu; Soy St. II, 1800 m., (MNHN, Paris).

The metathorax and wings are reduced in length.

***Agrypnus beccari* (Candèze) comb. n.**

*Lacon beccari* Candèze, 1880 : 192.

*Adelocera (Compsolacon) beccari* (Candèze); Van Zwaluwenburg, 1959 : 352.

Lectotype (designated by Van Zwaluwenburg, 1959 : 325): SUMATRA: Mt. Singalan,

Sumatra (MCSN, Genoa). Candèze's determination label is stuck on a catalogue card. Not examined.

Paralectotype. (Van Zwaluwenburg, loc. cit.) sex and data not recorded (IRSNB, Brussels). Not examined.

The generic attribution is based on Candèze's comment that *beccari* resembles *Lacon furunculoides* Candèze (see p. 157).

### *Agrypnus benitensis* nom. n.

*Lobotarsus depressus* Schwarz, 1902a : 312.

*Agrypnus depressus* (Schwarz) **comb. n.** [Junior secondary homonym of *Agrypnus depressus* (Candèze, 1874).]

Syntypes examined. EQUATORIAL GUINEA; 1 ♀ Benito, Congo Franc; *Lobotarsus depressus* Schw. n.sp. [Schw.]: *Lobotarsus depressus* Schw. type [Fleut.]. 1 ♀, same locality without determination label but labelled 'paratype'. (MNHN, Paris). 1 ♀, Benito, Congo Franc; Coll. Schwarz; *Tylotarsus* [unknown mss.] *depressus* [Schwarz]; Type (DEI, Eberswalde).

The designation of the lectotype is postponed pending the critical examination of the material.

### *Agrypnus bergeali* (Girard) **comb. n.**

*Archontas bergeali* Girard, 1970 : 29.

Holotype. ♂, MADAGASCAR: Madagascar centre, environs d'Ambohimahasoa, canton de Tsarafidy, forêt d'Ankafina, 1,450 m, 12.xi.1963 (*P. Viette*) (MNHN, Paris). Not examined.

Paratypes [number not recorded] same locality and date as holotype (MNHN, Paris and Girard Collection, Laboratoire de Zoologie, Ecole normale supérieure, Paris). Not examined.

The generic attribution is based on the description.

### *Agrypnus bidentata* (Fleutiaux) **comb. n.**

*Adelocera* (*Archontas*) *bidentata* Fleutiaux, 1934b : 53.

The description is based on an unrecorded number of specimens from MADAGASCAR: Mont Tsaratanana décembre (Descarpentries) in the author's collection.

Syntype-material: not located, ?MNHN, Paris.

The generic attribution is based on Fleutiaux's comment that this species resembles *A. turbidus* (Germar) and *A. antignus* (Candèze).

### *Agrypnus bidivisus* (Candèze) **comb. n.**

*Lacon bidivisus* Candèze, 1874 : 58.

*Adelocera bidivisus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). NIGERIA: ♀, Calabar; bidivisus Murr. Calab. [Candèze, blue border]; bidivisus Murr. [Cand.]; Lacon bidivisus Cd. det E. Candèze [IRSNB curatorial label]; Collection E. Candèze (IRSNB, Brussels).

Murray did not describe a species of this name. Candèze based his description on an unrecorded number of specimens in the Murray collection. No specimens of this species have been found in the Janson collection in the BMNH (see note on Murray collection, p. 279). It would appear that in this case Candèze retained the material submitted to him for determination.

The metasternum is greatly reduced in length and wings appear to be entirely absent. The fourth tarsal segment is lobed.

***Agrypnus bigener* (Elston) comb. n.**

*Lacon bigener* Elston, 1924 : 208.

*Lacon bigener* Elston; Neboiss, 1956 : 5.

The description is based on an unrecorded number of specimens from AUSTRALIA: Northern Territory, Port Darwin (*W. K. Hunt.*)

Syntype-material (see p. 274): SAM, Adelaide, AM, Sydney, NMV, Melbourne.

The generic attribution is based on a syntype ♀, labelled co-type (SAM, Adelaide).

***Agrypnus bimarginatus* (Schwarz) comb. n.**

*Lacon bimarginatus* Schwarz, 1908c : 93.

*Adelocera bimarginatus* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on a large number of specimens from Madagascar, Montagnes d'Ambre, received from Rolle, Berlin.

Syntype-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimens: MADAGASCAR: ♀, Mont d'Ambre, determined by Fleutiaux (BMNH). 1 ex., Amber Geb., Coll. Schwarz, determined by Fleutiaux (MNHN, Paris).

***Agrypnus binodulus* (Motschulsky)**

*Lacon binodulus* Motschulsky, 1861a : 8.

*Agrypnus binodulus* (Motschulsky); Kishii, 1964 : 14.

The description is based on an unrecorded number of specimens collected by Madame Gaschkevitch in Japan. This material has not been located. It may be in the Motschulsky collection in the ZMU, Moscow.

The generic attribution is based on the following specimen; JAPAN: ♂, Ins. Jesso [Hokkaido]; Janson coll. 1903.130; binodulus Motsch., named by Candèze [Gahan] (BMNH).

Kishii (1961 : 24; pl. 1, figs 1 and 5) described the subspecies *coreanus* from Korea and Tsushima Island. I have not had the opportunity of examining these

specimens but the shape of the aedeagus shown in the figure suggests that these specimens may not be congeneric with the generally accepted interpretation of *binodulus* represented by the material in the BMNH and MNHN, Paris.

The date of the description of *binodulus* is generally recorded as 1860, the date on the title-page. Griffin (1936) is of the opinion that the work did not appear until 1861 and in view of the fact that the introduction on p. 4 bears the date '1 Nov. 1860' Griffin's dating has been accepted.

### *Agrypnus bipapulatus* (Candèze)

*Lacon bipapulatus* Candèze, 1865 : 11.

*Agrypnus bipapulatus* (Candèze) Nakane & Kishii, 1955 : 4.

*Agrypnus sakishimanus* Ohira, 1967b : 100.

*Agrypnus* (*Agrypnus*) *bipapulatus sakishimanus* Ohira; Ohira, 1969 : 90.

*Lacon bipapulatus* Candèze. LECTOTYPE (present designation). ♀, CHINA: China; Janson coll. 1903.130. *Lacon bipapulatus* Cdz., China [Cand.]; *Lacon bipapulatus* Cdze. Type (ex coll. Cand.) [Janson] (BMNH).

*Lacon sakishimanus* Ohira. Holotype. JAPAN: ♂, in Ohira collection.

Paralectotypes. 3 ♀, Entomological Laboratory, College of Agriculture, Ehime University and/or Nagao, Sato, Subata and Kishii collections. I have not had the opportunity of examining this material.

### *Agrypnus bipunctatus* (Schwarz) **comb. n.**

*Lacon bipunctatus* Schwarz, 1908a : 82.

*Adelocera bipunctatus* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Madagascar, Plateau de l'Amdroy [sic], Region de Ambovombe.

Type-material: ? DEI, Eberswalde.

The generic attribution is based on the following specimen; MADAGASCAR: ♂, Plateau de l'Androy, Reg. de Ambovembe; *Lacon bipunctatus* Schw., comp. au type [Fleut.] (MNHN, Paris).

*Agrypnus bipunctatus* (Schwarz) is a junior secondary homonym of *Agrypnus bipunctatus* Candèze, 1857 (= *Lanelater bipunctatus* (Candèze) Arnett, 1952) but since the two species are not congeneric the junior name does not require replacement (CZN, Art. 59(b)).

### *Agrypnus blackburni* (Fleutiaux) **comb. n.**

*Lacon duplex* Candèze, 1897 : 9. [Junior primary homonym of *Lacon duplex* Blackburn, 1892.]

*Adelocera blackburni* Fleutiaux, 1926 : 97. [Replacement name for *Lacon duplex* Candèze.]

LECTOTYPE (present designation). INDIA: ♀, Sikkim, D. Atkins, 88; n.sp. 1893, duplex Cand., Sikkim, m. Genes [Candèze, yellow border]: Collection E.

Candèze; *Lacon duplex* Cand. Det. E. Candèze [IRSNB, curatorial label]. (IRSNB, Brussels).

The specimen measures 12.4 mm in length compared with the published measurement of 11 mm.

***Agrypnus blairei* (Fleutiaux) comb. n.**

*Adelocera blairei* Fleutiaux, 1927 : 77.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Tonkin, Lac Tho, Hoa Binh, A. de Cooman; *Adelocera blairei* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 2 ♂, 4 ♀, same locality as the lectotype, one with Fleutiaux's determination label. LAOS: 1 ♀, Pou-Lan, Ht. Mekong 13.5.18; Laos, Luan-Prabang environs, Vitalis de Salvaza (MNHN, Paris).

***Agrypnus brachychaetus* (Kollar) comb. n.**

*Lacon brachychaetus* Kollar, 1844 : 506.

*Adelocera brachychaetus* (Kollar) Fleutiaux, 1926 : 9.

The description is based on an unrecorded number of specimens from KASHMIR, presumably collected by Huegel.

Type-material: ?NM, Vienna. (Horn, 1935 : 119).

The generic attribution is based on the following specimens, which may be syntypes 2 ♂, Kashmir; Museum Paris, Collection Leon Fairmaire 1905; *Lacon brachychaetus* [?Fairm.] Fairm. det. [Fleut.] (MNHN, Paris).

***Agrypnus brevis* (Candèze) comb. n.**

*Lacon brevis* Candèze, 1857 : 156.

*Colaulon breve* [sic] (Candèze) Golbach, 1968 : 198.

LECTOTYPE (present designation). MEXICO: ♂, Yucatan; Coll. Janson, ex Candèze, *Lacon brevis* Cdz. Yucatan ♀ [Cand.]; *Lacon brevis* Cand. ex coll. Candèze [Gahan] (BMNH).

Paralectotypes. 1 ♀, *brevis* Cand. Yucatan [Champ]; Coll. Janson, ex Candèze (BMNH).

1 ex., Yucatan; *L. brevis* [Cand.]; Collection Chevrolat; *Lacon brevis* Cand, typ. Mon. [Fleut.] (MNHN. Paris).

***Agrypnus brightensis* (Blackburn) comb. n.**

*Lacon brightensis* Blackburn, 1891a : 503.

*Lacon brightensis* Blackburn, Neboiss, 1956 : 5.

LECTOTYPE (present designation). AUSTRALIA: ♂, 651 AL. T. [on card mount, see p. 270]; Australia, Blackburn Coll.; *Lacon brightensis* Blackb. [Blackb.]. (BMNH)

Paralectotypes: An unrecorded number of specimens in the AM, Sydney and SAM, Adelaide (Neboiss, 1956 : 5).

The published locality is Victoria; near Bright, under bark of *Eucalyptus*.

The wings and metasternum are much reduced in length.

***Agrypnus brunneipennis* (Candèze) comb. n.**

*Lacon brunneipennis* Candèze, 1857 : 133.

*Adelocera brunneipennis* (Candèze) Fleutiaux, 1926 : 96.

Holotype. N. INDIA: ♂, N. India [Janson]; Janson coll. ex Candèze 1903.130; *Lacon brunneipennis* Cdz., N. Indoun [sic, Cand.]; *Lacon brunneipennis* Cand. ex coll. Candèze [Gahan] (BMNH).

The published locality is 'Indes-Orientales', see p. 271.

***Agrypnus caffer* (Candèze) comb. n.**

*Lacon caffer* Candèze, 1881 : 7.

*Adelocera caffer* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). S. AFRICA: Caffrarie; n.sp. caffer Cdz., Caffr. [Candèze, yellow border]; Collection E. Candèze; ex type; *Lacon caffer* Cand., det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

***Agrypnus calamitosus* (Candèze) comb. n.**

*Lacon calamitosus* Candèze, 1874 : 100.

*Pyrganus calamitosus* (Candèze) Golbach, 1968 : 198.

The description is based on an unrecorded number of specimens from Mexico: Oajaca [sic] in the Sallé collection.

The generic attribution is based on the following specimen: MEXICO: ♀, Playa-Vincente; Mexico, Salle Coll; ♂, B.C.A. Col. (1) *Lacon calamitosus* Cand. [Champ]; *Lacon calamitosus* Cand. Sallé coll. 1420 [unknown mss. the number refers to Sallé mss. Catalogue] (BMNH).

Playa-Vincente is 110 km N.E. of Oaxaca. Champion (1895 : 266) regarded this specimen as the type, though he was aware of the discrepancy in the localities. The specimen is not recorded as a type in the Sallé mss. catalogue in the BMNH. Lectotype designation has been postponed until a search can be made for Candèze's material in the IRSNB, Brussels.

***Agrypnus caliginosus* (Boisduval) comb. n.**

*Adelocera grisea* Guérin, 1830, pl. 2, fig. 7. [Nomen oblitum.]

*Adelocera caliginosa* Boisduval, 1835 : 98.

*Elatér caliginosus* Boisduval, 1835 : 105. [Synonymized with *Lacon caliginosus* (Guérin) by Candèze, 1857 : 144.]

*Adelocera caliginosa* Guérin, 1838 : 68.

*Lacon caliginosus* (Boisduval) Germar, 1840 : 261.

*Lacon caliginosus* (Guérin); Neboiss, 1956 : 5.

This is the species which all workers, including Neboiss (1956 : 5), author of the most recent catalogue of Australian Elateridae, have credited to Guérin, generally with the date 1832.

The date 1832 for the 'Voyage autour du Monde... sur la Corvette... La Coquille pendant les années 1822, 1823, 1824 et 1825', volume 2, part 2, in which a description of *Adelocera caliginosa* Guérin appears on page 68, was given by Hagen (1863 : 310) and accepted by many subsequent bibliographers. However, according to Kirkaldy (1902 : 317) Hagen did not see this work, which though dated 1830 on the title page, bears the date 1838 at the end of the Avant-propos (p. xii) and contains references in the text to works published after 1832 (Bequaert, 1926 : 186). There can be no doubt that volume 2, part 2 of the text was published in 1838. The plates illustrating the insects described in the text were published between May 1830 and December 1831 (Guérin, 1838 : 271, Sherborne and Woodward, 1906 : 338). Plate 2 was published on 25th November, 1830.

The ready acceptance of Hagen's dating of Guérin's work was probably due to the fact that Boisduval (1835) gives references not only to the plates illustrating the voyage of the Coquille (published 1830-31, see above) but also to the text. For example on page 115 under *Lyctus parallelus* which is not illustrated by Guérin, Boisduval refers to Guérin, Voy. de la Coquille, Zool. p. 72, the page on which the description appeared in 1838. According to Sherborn and Woodward (1906 : 336) this 'is accounted for by the new widely recognized fact that the contemporary writers, working on the different French Voyages, then in course of compilation, often exchanged the proofs of their several works'. Boisduval, probably included Guérin's species because it was his intention (1835 : iii) to furnish his reader with 'un espèce de faune entomologique de l'Océanie'.

*Adelocera caliginosa* Boisduval. The description is presumably based on material collected at 'Hobart Town et à la terre de van Diemen [TASMANIA] in the course of a voyage around the world by the Astrolabe under the command of J. Dumont D'Urville. This collection should be in the MNHN, Paris (Boisduval, 1832 : 11, Horn & Kahle, 1935 : 63) but the most careful searches have failed to discover the material.

The fact that Boisduval refers to Guérin, Voy. de la Coquille, pl. ii, fig. 7 suggests that he believed that his Tasmanian *caliginosus* was identical with the Australian species depicted by Guérin, 1830 (with the name *grisea*, subsequently changed to *caliginosa*, see below). Since the species at present known as *Lacon caliginosus* (Guérin) is one of the few species which is fairly common in S.E. Australia and Tasmania, I suggest that a neotype of *Adelocera caliginosa* Boisduval be selected when suitable Tasmanian material belonging to the species at present known as *Lacon caliginosus* (Guérin) is found in the MNHN, Paris.

*Elater caliginosus* Boisduval. LECTOTYPE (present designation). AUSTRALIA: ♀, Dej. Nov. Holl. [Janson]; Agrypnus caliginosus Dej. Cat. ex. coll. Dejean [Janson]; *Lacon caliginosus* Cand. [Janson] Guer. [Gahan]; Janson coll. 1903 : 130 (BMNH).

The absence of a Dejean determination label (Horn & Kahle 1935 : pl. 24, no 45) is probably due to Janson, who may also have removed Boisduval's label, if it ever existed.

Why Boisduval failed to recognize that his *Agrypnus caliginosa* and *Elater caliginosus* are identical remains a mystery. It is possible that Guérin's comment (1838, Avant-propos) that Boisduval worked fast and carelessly is fully justified.

*Adelocera caliginosa* Guérin. The description is based on material from Port Jackson [Sydney, N.S.W.] collected in the course of a voyage around the world by the Coquille, commanded by Captain L. I. Duperry. This collection should be in the MNHN, Paris (Boisduval, 1832 : ii, Horn & Kahle 1936 : 258) but, once again, the most careful searches have failed to discover the material. Examination of the material standing as *Lacon caliginosus* (Guérin) in the BMNH and MNHN, Paris has shown that there is a general agreement concerning the identity of this species. I suggest that a neotype of this species be selected when suitable material becomes available in the MNHN, Paris.

The figure (pl. 2, fig. 7) illustrating Guérin's description of *Adelocera caliginosa* was published (see p. 135) on 25th November, 1830. The legend of the plate gives the name as *Adelocera grisea*. The reason why Guérin changed the name of his species, adopting that used by Boisduval, may be found in the Avant-propos (1838 : xi and 271). There he points out that Boisduval was not justified in disregarding the generally accepted practice of adopting a name published in conjunction with a figure or description. However, in order to show the lengths to which he was prepared to go to avoid accusations of confusing the synonymy, he proposed to accept Boisduval's new names for his figures. It is this magnanimous action together with the erroneous date on the title page that misled many workers into believing that Guérin's text was published before that of Boisduval.

*Adelocera grisea* Guérin, 1830. This is an available name in that it fulfills the provision of the International Code of Zoological Nomenclature, 1961. As the material on which the figure is based cannot be found (see above) and as I.C.Z.N. Article 75(6) forbids the designation of a neotype for a name not in general use, I am of the opinion that, in the interest of stability an application should be made to have *Adelocera grisea* Guérin, 1830 placed on the Official Index of Rejected Names.

Candèze (1857 : 161) remarks that *Agrypnus cribrosus* Eschscholtz (1829), described from Hawaii, bears some resemblance to *caliginosus* Guérin. The type-material of *cribrosus* has not been located but the description, size and distribution suggests that *cribrosus* may be conspecific with *Lacon modestus* (Boisduval). See also p. 72.

#### GERMAR'S INTERPRETATION OF *Lacon caliginosus* BOISDUVAL

Germar ascribed *caliginosus* to Boisduval, Faune de l'Océanie, *Elater caliginosus*. It may be assumed that he is referring to the species described by Boisduval, 1835 : 105. Germar records the locality of *E. caliginosus* as Van Diemensland [Tasmania]

in place of Boisduval's Nouvelle Holland [Australia]. This may be due to Germar confusing the localities of *Adelocera caliginosa* Boisduval and *Elater caliginosus* Boisduval or because his interpretation of the species was based on Tasmanian material identified by means of Boisduval's description.

Neither the BMNH, DEI, Eberswalde nor NMHU, Berlin, contain specimens from Tasmania determined by Germar. The BMNH contains a male and female from the Schaum collection. The male bears a determination label believed to be in Germar's handwriting (Horn & Kahle, 1935; pl. 37, no. 36); *caliginosus* Dej. Boisd., N. Holl. The female bears the number 1022 (referring to the manuscript catalogue of the Schaum collection) and a small blue triangular label with the letters 'Vd'. These letters may indicate Van Diemensland. The specimens agree well with Germar's description though the male is smaller (11.5 mm) and the female larger (13.6 mm) than Germar's published measurement of 6 lines (= 12.8 mm). Both specimens are conspecific with the lectotype of *E. caliginosus* Boisduval.

Despite the fact that the specimen with Germar's determination label originates from Australia, I am of the opinion that it represents Germar's interpretation of *E. caliginosus* Boisduval.

***Agrypnus candezei* (Fleutiaux) comb. n.**

*Lacon candezei* Fleutiaux, 1895a : 685.

*Adelocera candezei* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Tonkin, Florentin; *Lacon candezei* type [Fleut]; *Lacon inops* Cand., Cand. det. [Cand.]; *L. candezei* Fleut. Ann. Soc. ent. Fr. 1894 : 685 [Fleut]. (MNHN, Paris).

Paralectotypes. 3 ex., same locality as the lectotype, but without Fleutiaux's determination labels (MNHN, Paris).

The published locality is Lang-Son.

***Agrypnus canescens* (Candèze) comb. n.**

*Lacon canescens* Candèze, 1897 : 9.

*Archontas canescens* (Candèze) Cobos, 1970 : 133.

LECTOTYPE (present designation). W. AFRICA: ♀, n. sp. 1893 [sic] *canescens* Cand., Congo [Candèze, blue border]; *Lacon canescens* det. E. Candèze [IRSNB curatorial label]; Collection E. Candèze; Ex. Typis (IRSNB, Brussels).

The published locality is Ogoowé [Gabon].

***Agrypnus cariei* (Fleutiaux) comb. n.**

*Lacon cariei* Fleutiaux, 1920b : 490.

*Adelocera cariei* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MAURITIUS: ♂, Ile Maurice, Butte à l'Herbe, Carie, Juillet 1900; *Lacon cariei* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes: 1 ex., Mt. C. de Garde, U. d'Emmerez; Museum Paris, Madagascar [crossed out] Coll. Ch. Alluaud 1904; *Lacon cariei* Fleut. [Fleut.]. 1 ♂, Ile Maurice, Curipepe Levieux 1895; *Lacon desjardinsi* Cand.; Museum Paris, Coll. P. Carié 1914; *Lacon cariei* Fleut. [Fleut.]. 1 ♂ Ile Maurice, Curipepe, Carié 1897; Museum Paris, Coll. P. Carié 1914 (MNHN, Paris).

***Agrypnus carinicollis* (Schwarz) comb. n.**

*Lacon carinicollis* Schwarz, 1908a : 83.

*Adelocera carinicollis* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Madagascar.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen; MADAGASCAR: Forêts Nord, Ft. Dauphine, Alluaud; *carinicollis* Schw. [Fleut.] (MNHN, Paris).

***Agrypnus carinulatus* (Candèze) comb. n.**

*Lacon carinulatus* Candèze, 1857 : 152.

*Lacon carinulatus* Candèze; Neboiss, 1956 : 6.

LECTOTYPE (present designation). AUSTRALIA: ♀, Deyr. N. Holl.; Janson coll. 1903.130; *carinulatus* Cdz., type [Cand.]; *Lacon carinulatus* Cand. type (e coll. Deyrolle) [Janson] (BMNH).

Paralectotype: sex undetermined, Deyr. N. Holl.; Janson coll. 1903.130; *Lacon carinulatus* Cdze. Cand. e. coll. Deyrolle [Janson] (BMNH). The abdomen is missing.

The metasternum is reduced in length and the wings are short.

***Agrypnus castaneipennis* (Candèze) comb. n.**

*Lacon castaneipennis* Candèze, 1956 : 55.

*Adelocera castaneipennis* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens collected in Tananarive, MADAGASCAR by Alluaud.

Type-material: ?IRSNB, Brussels and/or Alluaud collection, MNHN, Paris.

The generic attribution is based on a specimen from Madagascar, Mt. Poraka, determined by Fleutiaux (MNHN, Paris).

***Agrypnus cervinus* Erichson comb. n.**

*Elater (Agrypnus) cervinus* Erichson, 1834 : 230.

*Adelocera cervinus* (Erichson) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). PHILIPPINES: ♂, 16111; *cervinus* Er.<sup>+</sup> Manilla, Mayen [Gerstaecker] (MNHU, Berlin).

***Agrypnus cinctipes* (Germar) comb. n.**

*Tylotarsus cinctipes* Germar, 1840 : 247.

LECTOTYPE (present designation). MADAGASCAR: ♂, Janson coll. ex Schaum, 1903.130; *cinctipes* Dj. [plus illegible word, crossed out] Klug, Madagascar [believed to be Germar's handwriting] (BMNH).

Germar records that he received this species determined as *Agrypnus cinctipes* Dej. from Dupont. Although there is no incontrovertible proof that this is Germar's original specimen, I believe it has a better claim than the two males in the MNHU, Berlin bearing the number 16083. One also bears a Gerstaecker label: *cinctipes* Germ., *cuspidatus* Cand., Madag. Goudot. Both are conspecific with the lectotype.

***Agrypnus cinerascens* (Candèze) comb. n.**

*Lacon cinerascens* Candèze, 1879a : 103.

*Adelocera cinerascens* (Candèze) Flautiaux, 1926 : 96.

Holotype. NEW GUINEA: Yule Is., collected by D'Albertis, ?MCSN, Genoa.

The generic attribution is based on the following specimen: 1 ex., N. Guinea Mer. Hula, Gemaio 1891, L. Loria; *cinerascens* Cand. [Fleut.]; Cand., Ann. Mus civ. Genoa 1892, p. 801 [Fleut.] (Candèze, 1891, locality) (MNHN, Paris).

***Agrypnus cineraceus* (Elston) comb. n.**

*Lacon cineraceus* Elston, 1927 : 359.

*Lacon cineraceus* Elston; Neboiss, 1956 : 6.

The description is based on an unrecorded number of specimens from AUSTRALIA: Queensland; Bowen (*A. Simson*), Normanton (*R. Kemp*).

Syntype material: (see p. 274) SAM, Adelaide, AM, Sydney.

The generic attribution is based on the following syntype: ♀, Normanton (*R. Kemp*) (SAM, Adelaide).

***Agrypnus cinnamomeus* (Candèze) comb. n.**

*Lacon cinnamomeus* Candèze, 1874 : 76.

*Lacon cinnamomeus* var. *a*, Candèze, 1874 : 76.

*Adelocera cinnamomeus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). USSR: ♂, Siberia or.; Janson coll. 1903.130; *Lacon cinnamomeus* Cand., type. E. Siberia [Gahan]; *Lacon* n.sp. (*cinnamomeus*) [Janson]; *Lacon argillaceus* Solsky [Gahan] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

Paralectotypes. 2 ♂, Siberia or.; Janson coll. 1903.130, one specimen bears an additional label; *Lacon cinnamomeus* Cand. E. Siberia [Gahan] (BMNH).

*A. cinnamomeus* var. *a*. LECTOTYPE (present designation). KOREA: ♂,

Corea, Vladimir Bay A. Adams; Janson coll. 1903 : 130; cinnamomeus var. [Cand.] (BMNH).

The published locality is 'Vladimir Bay dans la Corée. Coll. Janson.' As far as I can discover Vladimir Bay ( $43^{\circ}52'N.$ ,  $135^{\circ}30'E.$ ) is in Russia, about 200 miles north of the Korean border.

Fleutiaux's (1918a : 191) synonymy with *argillaceus* Solsky, 1870 has not been confirmed.

***Agrypnus coarctatus* (Candèze) comb. n.**

*Lacon coarctatus* Candèze, 1874 : 70.

*Adelocera coarctatus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from HIMALAYA in the Janson collection.

Type-material: not found in BMNH; ?lost.

The generic attribution is based on the following specimen; ♂, BURMAH, determined by Schwarz (BMNH).

***Agrypnus coctus* (Candèze) comb. n.**

*Lacon coctus* Candèze, 1874 : 66.

*Adelocera coctus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). BURMA: ♂, Rangoon; Janson coll. 1903. 130; *L. coctus* Cdz. type [Cand.]; *Lacon coctus* Cand. type [Gahan] (BMNH).

Paralectotypes. 1 ♂, Rangoon; Janson coll. 1903.130. *L. coctus* Cdz. type, [Cand.]. 1 ♂, Rangoon; Janson coll. 1903.130; *L. coctus* Cdz. [Cand.]. 3 ♂, 1 ♀, Rangoon, Janson coll., 1903.130 (BMNH).

***Agrypnus coenosus* (Hope)**

*Elater coenosus* Hope, 1831 : 25.

*Agrypnus coenosus* (Hope) Hope, 1843a : 63.

*Lacon nepalensis* Candèze, 1874 : 72. **Syn. n.**

*Adelocera nepalensis* (Candèze) Fleutiaux, 1926 : 96.

*Elater coenosus* Hope. LECTOTYPE (present designation). NEPAL: ♂, Nepal; coenosus Hope 4034; *Elater coenosus* Hope, type Grays Z. Misc. [Gahan]; Hardwicke Bequest (BMNH).

*Lacon nepalensis* Candèze. LECTOTYPE (present designation). NEPAL: ♀, Nepal; Janson coll. 1903.130; *nepalensis* Cdz. [Cand.]; *Lacon nepalensis* Cand., type [Gahan] (BMNH).

Paralectotype. ♀, Hardwicke, Nepal; Janson coll. 1903.130 (BMNH).

***Agrypnus cognatus* (Van Zwaluwenburg) comb. n.**

*Compsolacon cognatus* Van Zwaluwenburg, 1957 : 8, fig. 2a, 36.

*Adelocera* (*Compsolacon*) *cognatus* Van Zwaluwenburg; Van Zwaluwenburg, 1966 : 298.

Holotype. E. CAROLINES: ♂, No. 62925. (USNM, Washington). Allotype: ♀, same locality (BPBM, Honolulu). Not examined.

The generic attribution is based on the description and figures.

Van Zwaluwenburg (1966 : 298) believed this species to be a secondary junior homonym of *Adelocera cognatus* Candèze, 1892, and proposed a new name *A. nesiotus*. As the species are not congeneric (see also *Lacon cognata* (Candèze) p. 61), Van Zwaluwenburg's new name is unnecessary.

***Agrypnus collisus* (Candèze) comb. n.**

*Lacon collisus* Candèze, 1891a : 772.

*Adelocera collisus* Candèze; Fleutiaux, 1926 : 96.

The description is based on two syntypes from BURMA: Montagnes de Carin, [Karin] detroit des Cheba (900–1100) metres, decembre, Fea collection.

Syntypes: ?MCSN, Genoa.

The generic attribution is based on Candèze's comment that the species resembles *colonicus* Candèze and *taciturnus* Candèze. Both these species are now attributed to *Agrypnus*.

***Agrypnus colonicus* (Candèze) comb. n.**

*Lacon colonicus* Candèze, 1881 : 8.

*Adelocera colonica* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Cochinchina [S. Vietnam] in the Mniszech collection.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen; LAOS: 1 ♂, Ht. Laos; *Lacon colonicus* Cand. [Fleut.] (BMNH).

Miwa (1934 : 186) places *colonicus* in synonymy with *Paralacon taciturnus* (Candèze) but Fleutiaux (1947 : 263) treats *colonicus* and *taciturnus* as separate species of *Adelocera*.

In my opinion the specimen on which the generic attribution of *colonicus* is based is conspecific with the syntypes of *taciturnus* but examination of the type-material of *colonicus* is necessary before the synonymy can be confirmed.

Fleutiaux (1947 : 264) suggests that *Paralacon kawamurae* (Miwa, 1929 : 230) may be a synonym of this species. This cannot be confirmed until the type-material of *kawamurae* has been located and examined.

***Agrypnus colorata* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *colorata* Fleutiaux, 1934b : 53.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Baie d'Antongil, A. Mocquerys; *colorata* Fleut., type [Fleut.]. (MNHN, Paris).

***Agrypnus commutabilis* (Elston) comb. n.**

*Lacon commutabilis* Elston, 1924 : 207.

*Lacon commutabilis* Elston, Neboiss, 1956 : 6.

The description is based on an unrecorded number of specimens from AUSTRALIA: Northern Territory: Port Darwin (*W. K. Hunt*), coll. of Dr E. W. Furguson; North West Australia: Derby (*W. D. Dodd*), Noonkanbah (Dr *E. Mjoberg*).

Syntype-material (see p. 274): AM, Sydney, SAM, Adelaide, NMV, Melbourne.

The generic attribution is based on the following specimen; AUSTRALIA: ♀, Port Darwin, labelled cotype (SAM, Adelaide).

***Agrypnus comptus* (Candèze) comb. n.**

*Lacon comptus* Candèze, 1874 : 65.

*Adelocera comptus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens collected by Muhot and de Castelnau in 'Siam; Camboge' in the Janson, Saunders and Candèze collections.

Syntypes examined. CAMBODIA: 1 ♂, Camboja; Shantbon [position unknown]; Janson coll. 1903.130; *comptus* Cdz. [Cand.]; *Lacon comptus* Cand. [Gahan]. THAILAND: 1 ♀, Pachebon [Phet Buri, see *Adelocera mouhoti* p. 35], Muhot; Janson coll. 1903.130, ex. coll. Saunders; *comptus* Cdz. [Cand.] (BMNH).

Designation of a lectotype is postponed until any specimens extant in the Candèze collection in the IRSNB, Brussels have been examined.

***Agrypnus consobrinus* (Candèze) comb. n.**

*Lacon consobrinus* Candèze, 1857 : 125.

*Adelocera consobrinus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: ♀, Dej. India [Janson]; 285; Janson coll. 1903.130; *Lacon consobrinus* Cdz, Type e coll. Deyrolle [Janson]; *consobrinus* [Cand.] (BMNH).

The published locality is 'Indes-Orientales', see p. 271.

***Agrypnus consors* (Candèze) comb. n.**

*Lacon consors* Candèze, 1874 : 64.

*Adelocera consors* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: sex not determined, Madras; Janson coll. 1903.130; consors Cdz. [Cand.]; Lacon consors Cand. type [Gahan]. (BMNH). The abdomen is missing.

***Agrypnus conspiciendus* (Elston) comb. n.**

*Lacon conspiciendus* Elston, 1924 : 206.

*Lacon conspiciendus* Elston; Neboiss, 1956 : 6.

The description is based on an unrecorded number of specimens from AUSTRALIA: Northern Territory, King River.

Type-material (see p. 274): SAM, Adelaide, AM, Sydney.

The generic attribution is based on the following specimen: AUSTRALIA: ♀, Finke R. Gaus. (Dr H. Basedon); *Lacon conspiciendus* Elst. Finke R., C.A. (SAM, Adelaide). The specimen bears a close resemblance to *Agrypnus akidiformis* (Candèze).

***Agrypnus conspurcatus* (Candèze) comb. n.**

*Lacon conspurcatus* Candèze, 1895b : 56.

*Adelocera conspurcatus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Diego Suarez, Ch. Alluaud, 1893; Museum Paris, Madagascar, Coll. Ch. Alluaud; Type: *Lacon conspurcatus* Cand. n. sp. [Cand.]; Cand. det. 1895 [Fleut.] (MNHN, Paris).

Paralectotypes: 11 ex., same locality as lectotype. One bears a label: *conspurcatus* Cand., ex type. Ann. Belge 1895 : 56. (MNHN, Paris). 1 ♀, same locality as lectotype, with Fleutiaux's determination label (BMNH).

***Agrypnus cordicollis* (Candèze)**

*Lacon cordicollis* Candèze, 1865 : 9.

*Agrypnus cordicollis* (Candèze) Ohira, 1957 : 7.

The description appears to be based on a single specimen from Japan in the ZMU, Helsinki. Not examined.

The generic attribution is based on the following specimen: 1 ♂, JAPAN, determined by Janson (BMNH).

***Agrypnus cordipennis* (Candèze) comb. n.**

*Lacon cordipennis* Candèze, 1874 : 99.

*Lacon cordipennis* Candèze; Neboiss, 1956 : 6.

LECTOTYPE (present designation). AUSTRALIA: ♀, Port Albany, N. N. Holl; Janson coll. 1903.130; *cordipennis* Cdz. type [Cand.]; *Lacon cordipennis* Cand. type, Albany [Gahan] (BMNH). The metasternum and wings are reduced in length.

***Agrypnus costicollis* (Candèze) comb. n.**

*Lacon costicollis* Candèze, 1857 : 116.

*Archontas costicollis* (Candèze) Fleutiaux, 1947 : 282.

Holotype. Candèze based his description on a single specimen from 'Indes Orientales' (see p. 171) submitted by Deyrolle. The specimen is not in the BMNH. ?IRSNB, Brussels.

The generic attribution is based on the following specimen: INDIA: ♀, India; *Lacon costicollis* Cand. [Janson]; (BMNH).

***Agrypnus costipennis* (Germar) comb. n.**

*Lacon costipennis* Germar, 1848 : 181.

*Lacon yilgarnensis* Blackburn, 1892b : 289. **Syn. n.**

*Lacon costipennis* Germar; Neboiss, 1956 : 6.

*Lacon costipennis* Germar. LECTOTYPE (present designation). AUSTRALIA: ♂ Adelaide, Germ. Nr. 16137 [museum catalogue number = Adelaide, Germar] (MNHU, Berlin).

Paralectotypes: 1 ♂, 16137; Adelaide Germ.; 1 ♂, Adelaide Germ. Nr. 16137 (MNHU, Berlin).

The specimens stand beside a light blue label with Gerstaecker handwriting: *costipennis* Germ.+ Cand. Adelaide Germ. The absence of Germar's determination label is probably due to Gerstaecker (see p. 275).

*Lacon yilgarnensis* Blackburn. LECTOTYPE (present designation). AUSTRALIA: ♀, 4294T. Yilgarn [on card mount, see p. 270]; *Lacon yilgarnensis* Blackb. [Blackb.] (BMNH).

The description is based on an unrecorded number of specimens from Yilgarn, a goldfield in W. Australia, of which Southern Cross is the centre.

***Agrypnus crenatus* (Klug) comb. n.**

*Elater (Agrypnus) crenatus* Klug, 1833 : 66 (1834 : 154).

*Lacon terrenus* Germar, 1840 : 262. [Synonymized by Candèze, 1857 : 103.]

*Adelocera crenatus* (Klug) Fleutiaux, 1926 : 96.

*Elater (Agrypnus) crenatus* Klug. LECTOTYPE (present designation). MADAGASCAR: ♂, 16100 [museum catalogue number = Madagascar, Goudot]; Madagascar Goudot (MNHU, Berlin).

Paralectotype: ♂, 16100; Madagascar Goudot (MNHU, Berlin). The specimens stand beside a blue Gerstaecker label: *crenatus* Cand.,+ *Elat. crenatus* Klug, L. *terrenus* Germ. Madag. Goud.

*Lacon terrenus* Germar. LECTOTYPE (present designation). MADAGASCAR: ♂, 1019; Janson coll. ex Schaum, 1903.130; *terrenus* Germ., Madag. sp. propr. [Schaum] (BMNH).

Germar based his description of *terrenus* on an unrecorded number of Madagascan specimens received from Dupont. As Candèze (1857 : 104) records that he received 'le *L. terrenus* de Germar' from Schaum, it is reasonable to assume that Schaum relabelled the specimen while it was in his collection. There are no specimens bearing Germar's determination labels in the ZMHU, Berlin or DEI, Eberswalde.

For the history of the Germar collection see p. 275.

Germar (1840 : 263, 440) appears to have based his interpretation of *crenatus* Klug on Madagascan material collected and determined by Dupont. I have not been able to trace any of Dupont's (see p. 274) specimens bearing Germar's determination label. Germar's own collection was broken up (see p. 275). Neither the MNHU, Berlin nor the DEI, Eberswalde collections possess specimens with Germar's determination labels. The BMNH manuscript catalogue of the Schaum collection lists three specimens of *crenatus* Klug, and the collection contains the three specimens recorded below. These specimens agree well with Germar's description, in which he makes especial mention of the crenate lateral margin of the elytra, a distinctive feature not shown by *crenatus* Klug. Despite the absence of Germar's determination label, I have no doubt that the following three specimens which appear to belong to an undescribed species, formed part of, if not all, of the material examined by Germar.

MADAGASCAR: 1 ♂, Janson coll. ex Schaum, 1903.130; Dp. [manuscript on small blue triangular label, may indicate that this is Dupont's Madagascan material] (BMNH). 1 ♂, Janson coll. ex Schaum, 1903.130 (BMNH). 1 ♀, Janson coll. ex. Schaum, 1903.130; *crenatus* Klg. [Cand.] (BMNH).

### *Agrypnus crenicollis* (Ménétriés) **comb. rev.**

*Elater crenicollis* Ménétriés, 1832 : 156.

*Agrypnus crenicollis* (Ménétriés) Faldermann, 1835 : 166.

*Lacon crenicollis* (Ménétriés) Germar, 1840 : 265, pl. 1, fig. 1.

*Adelocera* (*Compsolacon*) *crenicollis* (Ménétriés) Van Zwaluwenburg, 1966 : 289.

The description is based on a large number ['Je l'ai trouvé en grand quantité . . .] of specimens from: Montagnes de Schiste, devant l'Elbouz [U.S.S.R.]. Fleutiaux (1947 : 47) states that the type [sic] is in the ZI, Leningrad.

The generic attribution is based on specimens from the Caucasus standing under this name in the BMNH and MNHN, Paris. There is a general agreement concerning the identity of this species.

GERMAR'S INTERPRETATION OF *Lacon crenicollis* MÉNÉTRIÉS. Germar gives only a short description of *crenicollis* from S. Russia without recording whether he possessed any specimens. I have not been able to trace any specimens determined by Germar. As Germar's figure agrees well with the specimens determined as *crenicollis* known to me, I have assumed that Germar identified the species correctly.

***Agrypnus curtus* (LeConte) sp. rev., comb. n.**

*Adelocera curtus* LeConte, 1853 : 491.

*Lacon curtus* (LeConte) Candèze, 1857 : 156.

*Adelocera curtus* LeConte; Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). U.S.A.: ♀, brick red disk [= Southern States, see p. 277]; *curtus* 2 (MCZ, Harvard). Length: 10.7 mm.

Paralectotype. ♀, brick red disk; Type, 2379 [MCZ curatorial label]; *Lacon curtus* Lec. [LeC.] (MCZ, Harvard). Length: 9.6 mm.

The published locality is Georgia. As LeConte records the length as .43 [inches = 11.3 mm] the larger specimen, which is also more the complete, of the two specimens in the LeConte collection has been designated as the lectotype. Why the paralectotype bears a label with the name *Lacon* in LeConte's handwriting is unknown. LeConte may have replaced his original label with one to correspond with Candèze's Monograph.

Arnett (1952 : 118) and also Golbach (1968 : 198) place *curtus* in synonymy with *rectangularis* Say, 1825. Since the type of *rectangularis* is lost (see p. 204) and the synonymy cannot be confirmed, *curtus* is here treated as a good species.

Arnett (loc. cit.) comments that the species displays a range of variation in the punctuation and the size of the interstriae of the elytra. This occurs in the material standing as *curtus* in the BMNH collection. These specimens also display a range of variation in the length of the wings. Some resemble the type-material in that the wing attains the base of the fifth abdominal sternite, while in others the wings barely attain the posterior margin of the third abdominal sternite.

LeConte states that 'this is the *Adelocera curtus* of the Dejean catalogue'. Four specimens (1 ♂, 3 ♀, Am. Bor.) from the Dejean collection in the BMNH agree well with the lectotype, except that they are slightly smaller in size (9–10.5 mm.) and have shorter wings.

***Agrypnus cuspidatus* (Klug) comb. n.**

*Elater (Conoderus) cuspidatus* Klug, 1833 : 66 (1834 : 154).

*Tilotarsus* [sic] *boildieui* Candèze, 1857 : 176. [Synonymized by Candèze, 1874 : 108.]

*Centrostethus cuspidatus* (Klug) Schwarz, 1898c : 414.

*Elater (Conoderus) cuspidatus* Klug. LECTOTYPE (present designation). MADAGASCAR: ♂, 16086 [museum catalogue number = Madagascar, Goudot]; Madagasc. Goudot (MNHU, Berlin). The specimen stands beside a blue Gerstaecker label: *cuspidatus* Klug, *boildieui* Cand. Madag. Goud. The absence of Klug's label is probably due to Gerstaecker (see p. 275).

*Tilotarsus boildieui* Candèze. Holotype ♂, *Tilotarsus boildieui* Cand., type [Gahan]; Coquerel; *Tilotarsus cuspidatus* Klug (Rev.) *boildieui* Cdze (Mon.) ex coll. de Laferté [Janson]; Janson coll. 1903.130 (BMNH). The absence of a Candèze's determination label is probably due to Janson (see p. 276).

The published locality is Madagascar.

***Agrypnus cylindripennis* (Fleutiaux) comb. n.**

*Adelocera* (Archontas) *cylindripennis* Fleutiaux, 1934b : 57.

LECTOTYPE (present designation). MADAGASCAR: ♀, Ambositra; *Adelocera* (Archontas) *cylindripennis* Fleut. type [Fleut]. (MNHN, Paris).

***Agrypnus davidi* (Fairmaire) comb. n.**

*Lacon davidi* Fairmaire, 1878 : 109.

*Lacon argillaceus* var. *davidi* Fairmaire; Fleutiaux, 1918 : 191.

*Archontas argillaceus* var. *davidi* (Fairmaire) Fleutiaux, 1947 : 279.

The description is based on an unrecorded number of specimens from CENTRAL CHINA, collected by the Abbé David. The present location of the material is unknown.

The generic attribution is based on the following specimen which may be a syntype; ♀, China, A. David; *L. davidis* [sic] Frm. [?Fairm.]: Museum Paris, Coll. R. Oberthur, 1952 (MNHN, Paris).

Examination of material in the BMNH and MNHN, Paris has shown that a number of species of very similar appearance are included under *argillaceus*. In my opinion *argillaceus* Solsky, *cinnamoneus* Candèze and *davidi* Fairmaire should be treated as separate species until such time as the type-material of all three species can be examined.

***Agrypnus dealbatus* (Candèze) comb. n.**

*Lacon dealbatus* Candèze, 1882 : 13.

*Lacon dealbatus* Candèze; Neboiss, 1956 : 7.

The description is based on an unrecorded number of specimens from C. York [Australia, Queensland].

Type-material: IRSNB, Brussels. Neboiss's statement that the type is in the IRSNB, Brussels cannot be accepted as a lectotype designation. Not examined.

The generic attribution is based on the following specimen which is probably a syntype; AUSTRALIA: ♀, C. York; *dealbatus* Cdz. [Cand.] (MNHN, Paris).

***Agrypnus deboulayi* (Candèze) comb. n.**

*Lacon deboulayi* Candèze, 1874 : 89.

*Lacon duboulayi* Candèze; Neboiss, 1956 : 7. [Unjustified emendation.]

LECTOTYPE (present designation). AUSTRALIA: ♂, Nikol Bay/N.W. N. Holl; Janson coll. 1903.130; *L. deboulayi* Cdz. type [Cand.]; *Lacon deboulayi* Cand. type, Nikol Bay [Gahan]. *Lacon* n.sp. *debilicornis* [Janson] (BMNH).

The metasternum is very short and the wings reduced to short flaps.

***Agrypnus decoratus* (Candèze) comb. n.**

*Lacon decoratus* Candèze, 1882 : 6.

*Adelocera decoratus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Madagascar.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: MADAGASCAR: ♀, Nossi Be, Coll. L. Fairmaire; *decoratus* Cand. [Cand.] (BMNH).

***Agrypnus defectus* (Candèze) comb. n.**

*Lacon defectus* Candèze, 1888 : 669.

*Adelocera defectus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on two specimens from BURMA: Tenasserim; Thagata, avril, Kawkareet, mai, collected by Fea, 1885-7.

Syntypes: ?MCSN, Genoa.

The generic attribution is based on the description.

***Agrypnus delesserti* (Candèze) comb. n.**

*Lacon delesserti* Candèze, 1882 : 9.

*Adelocera delesserti* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from INDIA: Neelgherries, collected by Delessert.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen; INDIA: H. L. Andrewes Nilgiri Hills; *Lacon delesserti* Cdze. (BMNH).

***Agrypnus denticollis* (Fleutiaux) comb. n.**

*Lacon denticollis* Fleutiaux, 1918b : 237.

*Adelocera denticollis* (Fleutiaux) Fleutiaux, 1926 : 98.

LECTOTYPE (present designation). KENYA: ♂, Museum Paris, Afrique Orient. Angl. Sud. du lac Rudolphe, Entre le Chemin de fer et le lac. Maurice Rothschild 1906; *Lacon denticollis* Fleut. type 1918 [Fleut]; = *tellini* Fleut. [Fleut] (MNHN, Paris).

Paralectotype. 1 ex, same locality as lectotype, but without determination label (MNHN, Paris).

The synonymy with *tellini* Fleutiaux, 1903 is unpublished and has not been confirmed.

***Agrypnus depressus* (Candèze) comb. n.**

*Lacon depressus* Candèze, 1874 : 77.

*Adelocera depressus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). KOREA (NORTH): ♀, Corea, Chosan, A. Adams; Lacon coll. 1903.130; *Lacon depressus* Cdz. [Cand.]; *Lacon depressus* Cand., type Chusan [Gahan] (BMNH).

***Agrypnus desjardinsii* (Candèze) comb. n.**

*Lacon desjardinsii* Candèze, 1857 : 143.

*Adelocera desjardinsii* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). ♂, MAURITIUS; Janson coll. ex Candèze, 1903.130; *Lacon desjardinsii* Cdz. 31. Maur. [Cand.]; *Lacon desjardinsii* Cand. ex coll. Candèze [Gahan] (BMNH).

Paralectotypes. MAURITIUS: 3♂, Dej., Ile de France [Janson]; Janson coll. 1903.130; *Lacon desjardinsii* Dej. Cdze. Cand. [Janson]; *Agrypnus desjardinsii* Dej. Cat. e coll. Dejean [Janson]. 1 ♂, Dej. Ile de France [Janson]; Janson coll. 1903.130; *Lacon desjardinsii* Dej. Cand. type [Janson]; *desjardinsii* Dej. Cat. e coll. Dejean [Janson] (BMNH).

Candèze states that he received specimens from de la Ferté Sénectère, Mniszech and Boheman and also refers to *Agrypnus desjardinsii* Dej. Cat. ed. 3, p. 99. I have not been able to trace any specimens determined by Candèze from these collections (see notes on collections consulted, p. 270).

***Agrypnus desquamatus* (Candèze) comb. n.**

*Lacon desquamatus* Candèze, 1857 : 124.

*Adelocera desquamatus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation): ♀ Deyr. India [Janson]; 284; Janson coll. 1903.130; *Lacon desquamatus* Cdze. Type e coll. Deyrolle [Janson] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

The published locality is 'Indes-Orientales', see p. 271.

***Agrypnus deyrollei* nom. n.**

*Lacon coenosus* Candèze, 1857 : 114.

*Adelocera coenosus* (Candèze) Fleutiaux, 1926 : 96.

*Agrypnus coenosus* (Candèze). **comb. n.** [Junior secondary homonym of *Agrypnus coenosus* (Hope, 1831).]

LECTOTYPE (present designation): ♀, Deyr. India [Janson]; 228; Janson coll. 1903.130; *L. coenosus* [Cand.]; *Lacon coenosus* Cdze. Type e coll. Deyrolle [Janson] (BMNH).

The published locality is 'Indes Orientales', see p. 271.

***Agrypnus dilaticollis* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *dilaticollis* Fleutiaux, 1934b : 50.

LECTOTYPE (present designation). ♀, MADAGASCAR: Madagascar, entre Soanierana et Foulpointe, Museum Paris; *Adelocera* (Lacon) [Fleut]; *dilaticollis* Fleut, type [Fleut.] (MNHN, Paris).

***Agrypnus discedens* (Candèze) comb. n.**

*Lacon discedens* Candèze, 1878a : 101.

*Adelocera discedens* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Ternate, [INDONESIA] (*Beccari*).

Type-material: ?MCSN, Genoa and/or IRSNB, Brussels.

The generic attribution is based on the following specimen: 1 ♂, 5 ex., TERNATE, *L. Laglaize*. One bears a label; *Lacon discedens* Cand. type [Cand.] (MNHN, Paris).

It is possible that these specimens are part of the syntype series, though how they come to be in the MNHN, Paris, is a mystery. I have not been able to discover whether Beccari visited Ternate. However Léon Laglaise, a French traveller and collector who was in touch with the Italian collectors in the region at the time, is known to have visited the island in 1877 (Salvadori, 1878 : 310).

***Agrypnus divaricatus* (Candèze) comb. n.**

*Lacon divaricatus* Candèze, 1865 : 12.

*Lacon divaricatus* Candèze; Neboiss, 1956 : 7.

LECTOTYPE (present designation). AUSTRALIA: ♀, N. Holl. Victoria, C. Cdze. [Janson]; *Lacon divaricatus* Cdz. Victoria [Cand.]; *Lacon divaricatus* Type (ex coll. Cand.) [Janson] (BMNH).

Candèze records the locality, under *victoriae*, as 'dans les environs de Melbourne'.

***Agrypnus dorcinus* (Candèze) comb. n.**

*Lacon dorcinus* Candèze, 1875 : CXIX.

*Adelocera dorcinus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from the Philippines; Bojol [sic. ?Bohol].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimens; PHILIPPINES: 6 ex., Dapitan, Mindanao, Baker; *dorcinus* Cand. [Fleut.] (Fleutiaux, 1916 : 219, locality) (MNHN, Paris).

***Agrypnus duplex* (Blackburn) comb. n.**

*Lacon duplex* Blackburn, 1891a : 506.

*Adelocera (Compsolacon) duplex* (Blackburn) Van Zwaluwenburg, 1959 : 353.

LECTOTYPE (designated by Van Zwaluwenburg, loc. cit.). AUSTRALIA: T. 1347V [on card mount, see p. 270]; Australia, Blackburn coll.; *Lacon duplex* Blackb. [Blackb.] (BMNH).

Paralectotypes (recorded by Neboiss, 1966 : 6) AM, Sydney, SAM, Adelaide. The published locality is Victoria.

***Agrypnus elliensis* (Candèze) comb. n.**

*Lacon elliensis* Candèze, 1865 : 10.

*Adelocera elliensis* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). CEYLON: ♂, Ceylon; Janson coll. 1903.130 *Lacon elliensis* Cdz. Ceylon [Cand.]; *Lacon elliensis* Cdze. Type ex coll. Cand. [Janson] (BMNH).

***Agrypnus ellipticus* (Candèze) comb. n.**

*Lacon ellipticus* Candèze, 1857 : 135.

*Lacon propinquus* Candèze, 1857 : 135. [Synonymized by Candèze, 1891 : 22.]

*Adelocera ellipticus* (Candèze) Fleutiaux, 1926 : 96.

*Lacon ellipticus* Candèze. The description is based on an unrecorded number of specimens from 'Himalaya' submitted by Schaum. The BMNH does not possess any specimens determined by Candèze, nor is the species recorded in the manuscript catalogue of the Schaum collection. I have been unable to locate the type-material. It has probably been lost (see history of the Schaum collection p. 280).

The generic attribution is based on the following specimen: 1 ♂, Muree [INDIA. N. Punjab] determined by H. E. Andrewes (BMNH).

*Lacon propinquus* Candèze. The description is based on an unrecorded number of specimens from 'Indes Orientales' (see p. 271) in the Schaum collection. I have been unable to trace this material (see history of the Schaum collection, p. 280). The synonymy is provisionally confirmed on the basis of a male from Rangoon, determined by Janson (BMNH).

***Agrypnus elstoni* (Neboiss) comb. n.**

*Lacon conspiciendus* Elston, 1927 : 353. [Junior secondary homonym of *L. conspiciendus* Elston, 1924 : 206.]

*Lacon elstoni* Neboiss, 1956 : 7. [Replacement name for *L. conspiciendus* Elston, 1927.]

The description is based on an unrecorded number of specimens from QUEENSLAND: Brisbane and NORTH-WEST AUSTRALIA: Kimberley District (Dr E. Mjöberg).

Type-material (see p. 274): SAM, Adelaide, AM, Sydney.

The generic attribution is based on Elston's comment that the species could be confused with *marmoratus* (see p. 181).

***Agrypnus eucalypti* (Blackburn) comb. n.**

*Lacon eucalypti* Blackburn, 1891a : 507.

*Lacon eucalypti* Blackburn; Neboiss, 1956 : 7.

LECTOTYPE (present designation). AUSTRALIA: ♂, Type; 321, [see p. 250] *Lacon eucalypti* Blackb. [Blackburn] (BMNH).

The published type-locality is S. Australia, near Port Lincoln, under bark of *Eucalyptus*.

***Agrypnus eximus* (Candèze) comb. n.**

*Lacon eximus* Candèze, 1857 : 101.

*Adelocera eximus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♀, Laf. Madagascar; Madag. Goudot; Janson coll. 1903.130; *Lacon eximus* Cdze. Cand. type e coll. de Laferté [Janson] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

Paralectotypes: 1 ♀, Madascar; Janson coll. ex Candèze, 1903.130; *Lacon eximus* Cdz. Mad. Mnz. [Cand.] (BMNH). 1 ♀, Madagascar; *eximus* Cdz. Mad. coll. Mn. [Cand., yellow border]; *Lacon eximus* Cand. det E. Candèze [IRSNB, curatorial label] (IRSNB, Brussels).

***Agrypnus fairmairei* (Candèze) comb. n.**

*Lacon fairmairei* Candèze, 1889 : 6.

*Adelocera fairmairei* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unknown number of specimens from Madagascar submitted by Fairmaire.

Type-material: ?IRSNB, Brussels and/or MNHN, Paris. See p. 271.

The generic attribution is based on the following specimen; MADAGASCAR: 1 ♀, Madag. determined from description by Gahan (BMNH).

***Agrypnus fallax* (Fairmaire) comb. n.**

*Lacon fallax* Fairmaire, 1903 : 202.

*Adelocera fallax* (Fairmaire) Fleutiaux, 1926 : 98.

LECTOTYPE (present designation). MADAGASCAR: ♀, Madag. Perrier [Fairm.] Type; Museum Paris, Madagascar, Coll. Perrier de la Bathie 1906; *Lacon fallax* Madag. [Fairm.] (MNHN, Paris).

Paralectotypes: 5 ex., Museum Paris, Madagascar, coll. Perrier de la Bathie,

1906. One specimen is labelled 'fallax, ex type'. the others lack determination labels. 1 ex., Museum Paris, Madagascar, Coll. Leon Fairmaire 1906. Lacks determination label (MNHN, Paris).

***Agrypnus falsarius* (Candèze) comb. n.**

*Lacon falsarius* Candèze, 1874 : 60.

*Adelocera falsarius* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). CEYLON: ♀, Ceylon; Janson coll. 1903.130; *L. falsarius* Cdz. [Cand.]; *Lacon falsarius* Cand. type, Ceylon [Gahan]; *L. caelibatus* n.sp. Ressemble à *l'elliensis* mais bien distincte, Fossettes tarsale très distinctes sur le pro. et mesothorax, elytres avec des stries de gros pointes *L. caelibatus* mihi [Cand.] (BMNH).

Candèze did not publish a description of *caelibatus*.

***Agrypnus farinensis* (Blackburn) comb. n.**

*Lacon farinensis* Blackburn, 1900 : 49.

*Adelocera (Compsolacon) farinensis* (Blackburn): Van Zwaluwenburg 1959 : 293.

Lectotype (designated by Van Zwaluwenburg, 1959 : 293, see p. 9). AUSTRALIA: ♂, 6710 Lyndh. T. [see p. 270] Australia, Blackburn Coll; *Lacon farinensis* Blackburn [Blackb.] (BMNH).

Paralectotypes (recorded by Neboiss, 1961 : 6). SAM, Adelaide.

***Agrypnus farinosus* (Candèze) comb. n.**

*Tilotarsus* [sic] *farinosus* Candèze, 1895a : 48.

*Lobotarsus farinosus* (Candèze) Schwarz, 1898a : 131.

The description is based on 3 specimens from TOGO submitted by Kraatz.

Syntypes: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♂, TOGO, Conradt, determined by Fleutiaux (MNHN, Paris).

***Agrypnus fastigiatus* (Schwarz) comb. n.**

*Lacon fastigiatus* Schwarz, 1898b : 185.

*Adelocera fastigiatus* (Schwarz) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). TANZANIA: ♀, Usamb. Weise; Coll. Schwarz; Type; *fastigiatus* Schw. [Schwarz] (DEI, Eberswalde).

Paralectotypes. 2 ♀ with locality, collection and type labels as lectotype, 1 ♀, Usambara; Coll. Schwarz; Type. (DEI, Eberswalde).

***Agrypnus fatuus* (Candèze) comb. n.**

*Lacon fatuus* Candèze, 1874 : 91.

*Lacon fatuus* Candèze; Neboiss, 1956 : 8.

Holotype. AUSTRALIA: ♂, 38153 [Fry catalogue number = data on next two labels]; De Boulay; N. W. Holl. N. West; Fry coll. 1905.100; *Lacon fatuus* Cdz. type [Cand.]; *Lacon fatuus* Cand. type, Austr. N. W. [Fry] (BMNH).

***Agrypnus feneriva* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *feneriva* Fleutiaux, 1934b : 53.

LECTOTYPE (present designation). MADAGASCAR: ♀, Fénérive; *feneriva* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus feralis* (Candèze) comb. n.**

*Lacon feralis* Candèze, 1891b : 243.

*Adelocera feralis* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from W. SUMATRA, Mandeling [position unknown, ? Mandelang R., 1°04'S., 102°42'E.], in the RNH, Leiden. Not examined.

The generic attribution is based on the description.

***Agrypnus fergusonii* (Elston) comb. n.**

*Lacon fergusonii* Elston, 1927 : 350.

*Lacon fergusonii* Elston; Neboiss, 1956 : 8.

The description is based on an unrecorded number of specimens from Queensland: Bowen (*A. Simpson*) and Townsville (*E. W. Ferguson*).

Syntype-material (see p. 274), AM, Sydney, SAM, Adelaide.

The generic attribution is based on the following specimen: AUSTRALIA: ♀, Bowen, Queensland, *A. Simpson*; cotype (SAM, Adelaide).

***Agrypnus ferrugineus* (Candèze) comb. n.**

*Lacon ferrugineus* Candèze, 1874 : 87.

*Lacon ferrugineus* Candèze; Neboiss, 1956 : 8.

LECTOTYPE (present designation). AUSTRALIA: ♂, 36820 [Fry catalogue number = data on next label] Nov. Holl. N. West; Fry Coll. 1905.100; *Lacon ferrugineus* Cand., Austr. N. West, Type [Fry]; *L. ferrugineus* [Cand.] (BMNH).

Paralectotype. ♀, W. AUSTRALIA, Nikol Bay; Janson coll. 1903 : 130; *L. ferrugineus* Cdz. [Cand.]; *Lacon ferrugineus* Cand., co-type [Gahan] (BMNH).

The published localities are: Australie nord-occidentale: Nickol-Bay (Coll. Fry et Jans.).

Both specimens differ from the description in that a slight depression for the accommodation of the posterior tarsi is present on the metasternum.

***Agrypnus ferruginipes* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *ferruginipes* Fleutiaux, 1932a : 50.

Holotype. MADAGASCAR: ♂, Diego Suarez; *Adelocera* (*Archontas*) *ferruginipes* Fleut., Type [Fleut.] (MNHN, Paris).

***Agrypnus fex* (Candèze) comb. n.**

*Lacon fex* Candèze, 1874 : 64.

*Adelocera fex* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Malacca [MALAYA] in the Janson collection. This material should be in the BMNH, but I have been unable to find it.

The generic attribution is based on the following specimen: ♀, no locality, *L. fex* Cand., Cand. det. [? Fleut.] (MNHN, Paris).

***Agrypnus fibrinus* (Candèze) comb. n.**

*Lacon fibrinus* Candèze, 1865 : 9.

*Adelocera fibrinus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from SUMATRA in the RNH, Leiden. Not examined.

The generic attribution is based on the following specimen: ♀ [tentative identification, contents of abdomen lost], Sumatra [Janson]; Muller; Janson coll. 1903.130; *Lacon fibrinus* Cdz. Sumatra, Sn [Cand.]; *Lacon fibrinus* Cdze. Type, ex Coll. Cand. [Janson] (BMNH). This may be one of the original syntype series which was retained by Candèze (see p. 271) and acquired by Janson.

***Agrypnus fictus* (Candèze) comb. n.**

*Lacon fictus* Candèze, 1868b : LIII (7).

*Adelocera fictus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Madagascar.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♀, MADAGASCAR: Coll. L. Fairmaire; *fictus* Cand. [Cand.]; Comp. type Fleut.] (MNHN, Paris).

***Agrypnus flavescens* (Candèze) comb. n.**

*Lacon flavescens* Candèze, 1874 : 66.

*Adelocera flavescens* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). CEYLON: ♂, Ceylon; Janson coll. 1903.130; *flavescens* Cdze., Type [Cand.]; *Lacon flavescens* Cand., Type [Gahan]; *Lacon sericans* ? [Janson] (BMNH).

***Agrypnus foedus* (Candèze) comb. n.**

*Lacon foedus* Candèze, 1857 : 123.

*Lacon alboseminatus* Kolbe, 1889 : 126. **Syn. n.**

*Adelocera foedus* (Candèze) Fleutiaux, 1926 : 96.

*Lacon foedus* Candèze. LECTOTYPE (present designation). SENEGAL: ♂, Senegal; Janson coll. ex Candèze, 1903.130; *Lacon foedus* Cdze. Seneg. [Cand.]; *Lacon foedus* Cand., ex coll. Cand. [Gahan] (BMNH).

*Lacon alboseminatus* Kolbe. LECTOTYPE (present designation). ZAIRE: ♂, Kwako bis Kimpoko [4°12'S., 15°33'E. Eastern shore of Stanley Pool]. Kongo, R. Buttner; *Lacon alboseminatus* [Kolbe] (MNHU, Berlin).

***Agrypnus formosanus* (Bates)**

*Lacon formosanus* Bates, 1866 : 348.

*Agrypnus formosanus* (Bates) Ohira, 1966 : 216.

LECTOTYPE (present designation). FORMOSA: ♀, Ins. Formosa; Janson coll. 1903.130; *Lacon formosanus* Bates, Formosa [Bates]; *Lacon formosanus* Bates, Type (ex coll. Bates) [Janson] (BMNH).

Paralectotype. ♂, Ins. Formosa; Janson coll. 1903.130; *Lacon formosanus* Bates (ex coll. Bates) [Janson] (BMNH).

***Agrypnus foveicollis* (Cobos) comb. n.**

*Lobotarsus foveicollis* Cobos, 1970 : 137.

Holotype. CONGO (BRAZZAVILLE): ♂, Sibiti Congo. xii. 1964; Museum Paris, Mission A. Descarpentries et A. Villiers; *Prolobotarsus foveicollis* nov. sp. Holotypus [Cobos] (MNHN, Paris).

Up to the present the generic name *Prolobotarsus* has not been published.

***Agrypnus frenchi* nom. n.**

*Lacon squalescens* Blackburn, 1892b : 289.

*Agrypnus squalescens* (Blackburn) **comb. n.** [Secondary junior homonym of *Agrypnus squalescens* (Fairmaire, 1871).]

The description is based on an unrecorded number of specimens from N. Queensland in the French collection (see p. 275). There is no justification for Neboiss' (1961 : 6) statement that the type is in the BMNH.

The generic attribution is based on the following syntype. AUSTRALIA: ♂, 6673

[see p. 270] N. Qu. T.; *Lacon squalescens* Blackb. [Blackb.] (BMNH). The species is not conspecific with *Agrypnus marmoratus* (Candèze).

***Agrypnus fuliginosus* (Candèze) comb. rev.**

*Lacon fuliginosus* Candèze, 1865 : 10.

*Agrypnus* (*Sabikikoreus*) *fuliginosus* (Candèze) Nakane & Kishii, 1955 : 3, pl. 2, fig. 5.

*Adelocera* (*Sabikikoreus*) *fuliginosus* (Candèze) Ohira, 1959 : 65.

LECTOTYPE (present designation). JAPAN: ♀, Japan, C. Cdz. [Janson]; Janson coll. ex. Candèze 1903.130; *Lacon fuliginosus* Cdz. Japan [Cand.]; *Lacon fuliginosus* Cdz., Type (ex coll. Cand.) [Janson] (BMNH).

***Agrypnus fulvastra* (Fleutiaux) comb. n.**

*Adelocera* (*Lacon des Auteurs*) *fulvastra* Fleutiaux, 1940a : 91.

LECTOTYPE (present designation). TIBET: ♀, Vrionatong, Thibet, Le Moulst, Paris XIII; *Adelocera* (*Lacon*) *fulvastra* n.sp. Fl., Type [Fleut.] (MNHN, Paris).

***Agrypnus fulvisparsus* (Candèze) comb. n.**

*Tilotarsus fulvisparsus* Candèze, 1874 : 109.

LECTOTYPE (present designation). GABON: ♀, Gabon; Janson coll. 1903.130; *T. fulvisparsus* Cdz., Type [Cand.]; *Tylotarsus fulvisparsus* Cdz. type ex coll. Doné [Janson] (BMNH). Candèze's (1891 : 27) synonymy with *Agrypnus nubilus* (Candèze) has not been confirmed. (see p. 191).

***Agrypnus furunculosus* (Candèze) comb. n.**

*Lacon furunculosus* Candèze, 1857 : 134.

*Adelocera furunculosus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from 'Des Indes orientales' (see p. 271) received from Schaum. I have not been able to locate these specimens (see histories of the Candèze and Schaum collections p. 271 and p. 280).

The generic attribution is based on the following specimen: ♀, *furunculosus* Cdz. [Cand.]; *Lacon furunculosus* Cand., named by Candèze [Gahan]; *scutellatus* ?? flancs du prothorax sans sillons obliques [unknown mss.] (BMNH). The specimen lacks a locality label.

***Agrypnus fuscus* (Fabricius) comb. n.**

*Elatér fuscus* Fabricius, 1801 : 228.

*Adelocera fuscus* (Fabricius); Van Zwaluwenburg, 1959 : 351.

Lectotype (designated by Van Zwaluwenburg, 1959 : 351). ♂ (not ♀ as stated by Van Zwaluwenburg), *fuscus* [Fabricius] (UZM, Copenhagen, Kiel Collection).

The description is based on material collected in AMBOINA by la Billardiére.

Latreille (1829 : 451) included *fuscus* Fabricius in *Adelocera*. In the same year Eschscholtz (1829 : 32) transferred it to *Melanotus* and every subsequent worker has followed suit, listing *fuscus* Fabricius under *Melanotus* or one of its synonyms. The confusion seems to have arisen when Candèze (1860 : 336) synonymized *E. fuscus* Fabricius with *Cratonychus fuscus* Erichson (1841 : 106). The description of *C. fuscus* Erichson leaves no doubt that it is not conspecific with *E. fuscus* Fabricius. Erichson's species is probably the *Melanotus fuscus* (Fabricius) of authors and in collections.

### *Agrypnus gabonensis* nom. n.

*Tilotarsus* [sic] *reductus* Candèze, 1882 : 14.

*Lobotarsus reductus* (Candèze) Schwarz, 1906 : 30.

*Agrypnus reductus* (Candèze) **comb. n.** [Junior secondary homonym of *Agrypnus reductus* (Candèze, 1878).]

The description is based on an unrecorded number of specimens from GABON.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on a specimen from Gabon standing over this name in the MNHN, Paris.

### *Agrypnus gazagnairei* (Candèze) **comb. n.**

*Tilotarsus* [sic] *gazagnairei* Candèze, 1889 : 74 (9).

*Centrostethus gazagnairei* (Candèze) Schwarz, 1898c : 414.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Museum Paris, Goudot, 1834; 4177; Lacon detalus Cat.-Mus.; *Tilotarsus gazagnairei* Cand. [?Cand.] Candèze vid. [unknown mss.] (MNHN, Paris).

### *Agrypnus geminatus* (Candèze) **comb. n.**

*Lacon geminatus* Candèze, 1857 : 149, pl. 2, fig. 5.

*Lacon geminatus* (Candèze) Neboiss, 1956 : 8.

The description was based on an unrecorded number of specimens from Nouvelle-Hollande [Australia]. Since Candèze does not record the location of the material it is almost certain that it is in the BMNH (see history of the Candèze collection, p. 271). I do not know on what evidence Neboiss (loc. cit.) bases his statement that the type is in the IRSNB, Brussels. Pending further investigation the BMNH specimen is here treated as a syntype.

Syntype examined. AUSTRALIA: ♀, N. W. Holl., C. Cdze.; Janson coll. ex Candèze; *Lacon geminatus* C. N. Austr. Th. [Cand.]; *Lacon geminatus* Cdze., ex coll. Cand. [Janson] ? Type [Gahan] (BMNH).

***Agrypnus gibberosus* (Candèze) comb. n.**

*Lacon gibberosus* Candèze, 1889 : 71 (5).

*Adelocera gibberosus* (Candèze) Fleutiaux, 1926 : 96.

The description was based on an unrecorded number of specimens from Madagascar in the MNHN, Paris. I have been unable to find this material. The specimen recorded below, as Fleutiaux' labels imply, may be part of Candèze's original series.

The generic attribution is based on the following specimen standing as *gibberosus* Candèze: ♂, MADAGASCAR, Goudot 1834; ? Type ?; type ? ayant perdu son étiquette [Fleut.] (MNHN, Paris).

***Agrypnus gibbus* (Candèze) comb. n.**

*Lacon gibbus* Candèze, 1882 : 10.

*Lacon gibbus* Candèze; Neboiss, 1956 : 8.

The description is based on an unknown number of specimens from Cleveland Bay, Australia, from the de Monchicourt [Horn & Kahle, 1936 : 181, via Candèze to IRSNB, Brussels], and Mniszech (see p. 278) collections. According to Neboiss (loc.cit.) the type is in the IRSNB, Brussels, but since Candèze clearly has more than one specimen and did not designate a type, a formal lectotype designation is required. I have not seen the type-material in the IRSNB, Brussels.

The generic attribution is based on the following specimen: AUSTRALIA: 1 ♀, *L. gibbus* Cand. [Cand.]; Aust. Sept., ex Oberthur (MNHN, Paris).

***Agrypnus glirinus* (Candèze) comb. n.**

*Lacon glirinus* Candèze, 1865 : 11.

*Adelocera glirinus* (Candèze) Fleutiaux, 1926 : 98.

LECTOTYPE (present designation). FIJI Is.: Ins. Fidjii; Janson coll. ex Candèze, 1903.130; *Lacon glirinus* Cdz. Fidjee, Thorey [Cand.]; *Lacon glirinus* Cdz., Type (ex coll. Cand.) [Janson] (BMNH). The abdomen is missing.

***Agrypnus goudotii* (Candèze) comb. n.**

*Lacon goudotii* Candèze, 1857 : 106, pl. 2, fig. 1.

*Lacon goudotii* (Candèze) Fleutiaux, 1926 : 99.

Candèze's comment that the last abdominal segment is sometimes smooth suggests that he had specimens of both sexes before him at the time of the description. He records the length and width as 25 mill. and 8½ mill. respectively (1 mm longer than the figure). Up to the present time I have been unable to locate a specimen of this size in the BMNH collections. The female from the Dejean collection bearing Jansons determination label with the word 'Type' measures only 22 mm.

Designation of the lectotype is postponed until a further search has been made for Candèze's material.

The generic attribution is based on the following specimen: ♀, MADAGASCAR: Janson coll. ex. Candèze, 1903.130; *Lacon goudotii* Cdz. Mad. [Cand.] (BMNH).

***Agrypnus gracilentus* (Schwarz) comb. n.**

*Lacon gracilentus* Schwarz, 1902f : 306.

*Adelocera gracilentus* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens collected in the Salomo Is. (Tulagi) by R. v. Bennigsen.

Syntype-material: ?DEI, Eberswalde.

Generic attribution based on the following specimens: SOLOMON IS.: 1 ex., Salomon Is. Guadalcanal, Lavoro, H. T. Pagden, 16.ii.34, Wild fig; *Adelocera gracilenta* (Schw.) [Van Z.] (BMNH).

***Agrypnus gracilis* (Candèze) comb. n.**

*Lacon gracilis* Candèze, 1874 : 83.

*Adelocera (Compsolacon) gracilis* (Candèze); Van Zwaluwenburg, 1966 : 289.

The description is based on an unrecorded number of specimens from 'Gilolo, Batchian, Aru, Waigioe, Kai, Mysol, Nlle Guinée.' etc. Although this species formed part of Candèze's second collection (see p. 271), there can be no doubt that the specimens listed below are syntypes, presumably acquired by Janson. The rest of the material, which I have not seen, should be in the IRSNB, Brussels.

Syntypes examined. INDONESIA: 1 ♀, Wagiou; Janson coll., ex Candèze, 1903.130; *Lacon gracilis* Cdz., n.sp. Waigioe [Cand.]; *Lacon gracilis* Cand., Type ex coll. Cand. [Gahan]. 1 ex., Wag. Wallace; ex coll. Saunders; Janson coll. 1903.130; *gracilis* Cdz. [Cand.]. 1 ♂, C. W. Gilolo; Janson coll. 1903.130; *gracilis* Cdz. [two Candèze determination labels]. 1 ♂, C. W. Gilolo; Janson coll. 1903.130. 1 ex. (badly damaged) Mysol; Janson coll. 1903.130; *gracilis* Cdz. [Cand.]. 1 ♀, Ins Kaisa (sic); Janson coll. 1903.130; *gracilis* [Cand.]. 1 ♀, Ins Aru, Dept.; Janson coll. 1903.130. 2 ♂, N. W. N. Guinea/C. W.; Janson coll. 1903.130 (BMNH).

***Agrypnus gragetensis* (Szombathy) comb. n.**

*Lacon gragetensis* Szombathy, 1909 : 119; fig. 2.

*Adelocera gragetensis* (Szombathy) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). NEW GUINEA: ♀, Ins. Graget, Biro; *Lacon gragetensis* n.sp. [Szomb.] (TM, Budapest).

***Agrypnus granulatus* (MacLeay) comb. n.**

*Lacon granulatus* MacLeay, 1872 : 251.

*Lacon granulatus* (MacLeay); Neboiss, 1956 : 8.

The description is based on an unrecorded number of specimens from Gayndah (Australia, Queensland) collected by Mr Masters. Neboiss states that the type is in the AM, Sydney, but since he publishes no details concerning the specimen, his statement cannot be accepted as a lectotype designation.

The generic attribution is based on the following specimen: AUSTRALIA: ♂, Gayndah, Queensland, Masters; *Lacon granulatus* McLeay [? MacLeay] (MNHN, Paris). This specimen is almost certainly a syntype, presumably acquired by the MNHN, Paris as a gift or by exchange.

***Agrypnus griseopilosa* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *griseopilosa* Fleutiaux, 1932a : 49.

LECTOTYPE (present designation). MADAGASCAR: ♀, Diego Suarez; Type; *griseopilosa* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 2 ♀, 1 ♂, same locality but without determination labels (MNHN, Paris).

The specimens from the second recorded locality, Monts de Francais, [S. E. of Diego-Suarez] have not been located.

***Agrypnus grisescens* (Candèze) comb. n.**

*Lacon grisescens* Candèze, 1874 : 52.

*Adelocera grisescens* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagas.; Janson coll. ex Candèze, 1903.130; *grisescens* Cdz., type unique [Cand.]; *Lacon grisescens* Cand. type [Gahan] (BMNH).

As the description was published after 1869 (see p. 271) one would expect to find the type-material in the IRSNB, Brussels. However the only specimen in that collection with Candèze's determination label was collected on Nossi Be by Brandt and measures 14 mm, compared with the published length of 12 mm. How this specimen came into Janson's possession remains a mystery.

***Agrypnus guttatus* (Candèze) comb. n.**

*Lacon guttatus* Candèze, 1857 : 151.

*Lacon guttatus* Candèze; Neboiss, 1956 : 8.

Holotype. AUSTRALIA: ♂, Melb. B.; 63.10 [BMNH registration number = G. R. Waterhouse collection, purchased of Stevens]; *Lacon guttatus* Cand. [Cand.]; *Lacon guttatus* Candèze, Type [C. O. Waterhouse] (BMNH).

I have not had the opportunity of examining the type of *L. maculatus* Macleay, 1872, which according to Lea (1920 : 379) is a small specimen of *guttatus* (Candèze).

***Agrypnus gypsatus* (Candèze) comb. n.**

*Lacon gypsatus* Candèze, 1891a : 773.

*Archontas gypsatus* (Candèze) Fleutiaux, 1947 : 283.

The description is based on a large, but unrecorded number of specimens collected by Fea in the Carin Cheba mountains in December 1888.

Syntype-material: the main part should be in the MCSN, Genoa, but various workers appear to have obtained syntypes (see below).

Syntypes examined: BURMA: 1 ♂, Carin Cheba, 900–1000 m. L. Fea v.xii–88; co-type [BMNH curatorial label]; *Lacon grypratus* [sic] Cand.; Andrewes Bequest, B.M. 1922: 221 (BMNH). 1 ex., same locality and date; *L. gypsatus* ex. type Cdz. [? Cand.], Cand. Ann. Mus. Gen. 1888 et 1891 sec Gestro [Fleut.]. 1 ♂, Carin Cheba, 900–1100 m. L. Fea xii–88; *L. gypsatus* Cdz. n.sp. [Cand.]. 1 ♀, same locality without determination label (MNHN, Paris). Candèze did not record the species in 1888.

***Agrypnus haedulus* (Candèze) comb. n.**

*Lacon haedulus* Candèze, 1857 : 122; pl. 2, fig. 10.

*Adelocera haedulus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. ♂, Laf. Ind. bor. Bacon [Janson]; Janson coll. 1903 : 130; *haedulus* Cdz., type [Cand.]; *Lacon haedulus* Cdze. Cand. Type e coll. de Laferté [Janson] (BMNH).

The published locality is 'Indes-Orientales boreales', see p. 271.

***Agrypnus hastatus* (Candèze) comb. n.**

*Tilotarsus* [sic] *hastatus* Candèze, 1857 : 177.

*Centrosetthus hastatus* (Candèze) Schwarz, 1898c : 414.

The description is based on Madagascan specimens received by the author from Klug as *hastatus* and M. de la Ferté Seneclère as '*A. spinicollis* in coll. Dejean'.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Goud, No. 16088 (MNHU, Berlin).

Paralectotypes. 1 ♀, 16088; Madagascar Goud. (MNHU, Berlin). 1 ♂, Madagascar; Janson coll. 1903.130; *Tilotarsus hastatus* Cdze, type, *Ag. spinicollis* Dej. ex. coll. Dejean [Janson]. 1 ♀, 1 ♂ same data, but without the word 'type' on the determination label. 1 ♂, Madagascar, Janson coll. 1903.130; *Tilotarsus hastatus* Cdz., Madag. [Cand.]; *Tilotarsus hastatus* Cdze, ex. coll. Cand. [Janson] (BMNH).

The MNHU, Berlin specimens stand beside Gerstaecker's label: *hastatus* Cand., Madag. Goud. Despite the absence of Klug's and Candèze's labels, which is probably due to Gerstaecker (see p. 275), these are believed to be the specimens submitted, with the name *hastatus*, to Candèze by Klug. The number 16088 on these specimens refers to a catalogue and list of localities in the MNHU, Berlin.

The three specimens from the Dejean collection are those submitted by de la Ferté Sénectère. They are recorded in de la Ferté Sénectère's manuscript list (in BMNH) of Dejean specimens sent to Candèze for determination. The absence of Dejean's and/or Candèze's determination labels and of any indication that they formed part of de la Ferté Sénectère's collection is probably due to Janson (see p. 276). I have assumed that the specimen from the Candèze collection is one retained by Candèze at the time of the description.

***Agrypnus haterumana* (Ohira) comb. n.**

*Colaulon* (*Cryptolacon*) *haterumana* Ohira, 1967b : 104.

Holotype. Hateruma-jima near Ishigaki, 27.vii.1964 (*M. Yasui*). Ohira collection. Not examined.

The generic attribution is based on the description.

***Agrypnus herzi* (Koenig) comb. n.**

*Lacon herzi* Koenig, 1887 : 353.

*Adelocera herzi* (Koenig) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens collected in KOREA by O. Herz and submitted to Koenig by D. G. Sievers.

Type-material: ?ZI, Leningrad (Horn and Kahle, 1935 : 138).

The generic attribution is based on the description. The species bears a resemblance to *A. judex* (Candèze) and *A. setiger* (Bates) in that erect setae are present on the elytra.

***Agrypnus hexagonus* (Candèze) comb. n.**

*Tilotarsus* [sic] *hexagonus* Candèze, 1893b : 13.

*Lobotarsus hexagonus* (Candèze) Schwarz, 1906 : 30.

The description is based on an unrecorded number of specimens from Antananarivo [MADAGASCAR].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♀, Museum Paris, Madagascar, Coll. Ch. Alluaud, 1904; *Tilotarsus hexagonus* Cand. [Cand.] Cand. det. 1895 (MNHN, Paris).

***Agrypnus hispidulus* (Candèze) comb. n.***Lacon hispidulus* Candèze, 1857 : 126.*Adelocera hispidulus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). JAVA: ♀, Dej. Java [Janson]; Janson coll. 1903.130; *Lacon hispidulus* Cdze., Cand. Type e coll. Dejean [Janson] (BMNH). The absence of Dejean and Candèze determination labels may be ascribed to Janson (see p. 276).

***Agrypnus holosericeus* (Candèze) comb. n.***Lacon holosericeus* Candèze, 1893 : 170.*Adelocera holosericeus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on a large number of specimens, collected by Bell in Kanara, in the Andrewes collection. Since Candèze may have retained specimens for his own collection, the designation of a lectotype is postponed until any material in the IRSNB, Brussels has been examined.

Syntypes examined: INDIA: Mysore, 1 ♂, Kanara; Type (BMNH curatorial label); *Lacon holosericeus* Cand. Kanara [Gahan]; *Lacon holosericeus* Cand. n.sp. ♂ [?Candèze]. 1 ♂, Kanara; cotype [BMNH curatorial label]; *Lacon holosericeus* Cand. 3 ♂, Kanara; Andrewes coll. BM. 1933.109. One specimen bears Andrewes determination label: *Lacon holosericeus* Cand. 6 ♂, 1 ♀, Cotype [BMNH curatorial label] Kanara; Andrewes Bequest BM, 1922.221. One specimen bears Andrewes determination label: *Lacon holosericeus* Cand. (BMNH). 1 ex., Kanara; *L. holosericeus* [? Cand.]; *L. holosericeus* Cand. Ann. Soc. Ent. Belge. 1893 : 170 (NMHN, Paris).

***Agrypnus horni* (Schwarz) comb. n.***Lacon lineatus* Schwarz, 1901 : 18. [Homonym of *Lacon lineatus* Candèze 1896 : 8.]*Lacon horni* Schwarz, 1902e : 155. [Replacement name for *Lacon lineatus* Schwarz.]*Adelocera horni* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from CEYLON: Matala, Kandy, Paradna.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen: ♂, Ceylon, Nietn.; 16119; *Lacon lineatus* Schw. [Schwarz] (MNHU, Berlin).

***Agrypnus hottentota* (Candèze) comb. n.***Lacon hottentota* Candèze, 1857 : 138.*Adelocera hottentota* (Candèze) Fleutiaux, 1926 : 96.

Holotype. SOUTH AFRICA: Laf. P.B.S. [Promontorium Bonae Spei]; Janson

coll. 1903 : 130; *L. hottentota* Cdz. Type [Cand.]; 276; *Lacon hottentota* Cdze. Cand. Type coll. de Laferté [Janson] (BMNH).

The metasternum and wings are much reduced in length.

***Agrypnus hova* (Fleutiaux) comb. n.**

*Lacon scutellatus* Fairmaire, 1903 : 202. [Junior primary homonym of *Lacon scutellatus* Candèze, 1893.]

*Adelocera hova* Fleutiaux, 1926 : 99. [Replacement name for *Lacon scutellatus* Fairmaire.]

LECTOTYPE (present designation). MADAGASCAR: ♂, Madag. Perrier [Fairm.]; Museum Paris, coll. Perrier de la Bathie 1906; type; *Lacon* [Fleut.] *scutellatus* [Fairm.] (MNHN, Paris).

Paralectotypes. 1 ex., Madag. Perrier [Fairm.]; Museum Paris, coll. Perrier de la Bathie 1906; *scutellata* Fairm. ex typ. [Fleut.]; *hova* Fleut., *scutellatus* Fairm. nec Cand. [Fleut.] 1 ex., locality and collection labels as lectotype. 4 ex., locality label as lectotype. The last five paralectotypes lack determination labels. (MNHN, Paris).

The published locality is: Environs de Suberbieville (*H. Perrier*).

***Agrypnus humilis* (Erichson) comb. n.**

*Lacon humilis* Erichson, 1842 : 136.

*Lacon humilis* Erichson; Neboiss, 1956 : 9.

LECTOTYPE (present designation). TASMANIA: ♂, Terra Van Diem. Schayer, Nr. 16139 [museum catalogue number, refers to locality on label]; *humilis* Er. + Cand. Van Dem. Schayer [Gerstaecker, mauve label] (MNHU, Berlin).

The description is based on an unrecorded number of specimens collected by Schayer at Woolnorth [40°39'S., 144°43'E.], Tasmania and sent to the MNHU, Berlin (Germar, 1842 : 84). Candèze (1857 : 184) states that he saw the single specimen of this species in that museum. The absence of Erichson's label is probably due to Gerstaecker (see p. 275).

***Agrypnus hypnicola* (Kishii) comb. n.**

*Colaulon (Cryptolacon) hypnicola* Kishii, 1964 : 33; pl. 1, figs 5, 6; pl. 3, fig. 9.

The description is based on a holotype, allotype and 311 paratypes from six localities in JAPAN. Two paratypes are in the T. Shubata collection, but the location of the remainder is not recorded. They are probably in the author's collection, and that of the Heinan High School, Kyoto. As the author records the data on each specimen there should be no difficulty in recognizing the material.

The generic attribution is based on the description.

***Agrypnus illimis* (Horn) comb. n.**

*Lacon illimis* Horn, 1894 : 336.

*Colaulon illimis* (Horn) Arnett, 1952 : 119.

LECTOTYPE (present designation). U.S.A.: ♀, Tucson, Arizona, Wickham; 396; Type No. 3329; *L. illimis* Horn [Horn] (ANS, Philadelphia). Length 8.5 mm.

The description is based on an unrecorded number of specimens from Tucson (Wickham) and near Yuma, Arizona. Up to the present time only the specimen designated as the lectotype has been located.

***Agrypnus impressicollis* (Elston) comb. n.**

*Lacon impressicollis* Elston, 1924 : 202.

*Lacon impressicollis* Elston; Neboiss, 1956 : 9.

The description is based on an unrecorded number of specimens from TASMANIA, George Town, Ben Lomond (4,000 ft).

Syntypes (see p. 274): SAM, Adelaide, AM, Sydney, NMU, Melbourne.

The generic attribution based on the following syntypes: 2 ♂, Tasmania, George Town; co-type (SAM, Adelaide).

***Agrypnus impressus* (Candèze) comb. n.**

*Lacon impressus* Candèze, 1878a : 102.

*Adelocera impressus* (Candèze) Fleutiaux, 1926 : 96.

Lectotype (designated by Van Zwaluwenburg, 1959 : 353). NEW GUINEA: Andai, New Guinea (Beccari) (MCSN, Genoa). Not examined.

Paralectotype. 1 ex., recorded by Van Zwaluwenburg (loc. cit.) (MCSN, Genoa). Not examined. Van Zwaluwenburg does not record any details of the determination labels on the specimens.

The generic attribution is based upon the description.

***Agrypnus inaequalis* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *inaequalis* Fleutiaux, 1934b : 52.

LECTOTYPE (present designation). MADAGASCAR: ?♀, Madagascar, Baie d'Antongil, A. Mocquerys; *inaequalis* Fleut., Type [Fleut.] (MNHN, Paris).

Paralectotypes. 1 ♂, 3 ♀, same locality as the lectotype without determination labels. 1 ♂, 2 ♀, Fianarantsoa, without identification labels. 1 ♀, Museum Paris, Madagascar. Prov. de Fenerive, Reg. de Soanierana, A. Mathieux 1905, without identification labels (MNHN, Paris).

***Agrypnus incertus* (Fleutiaux) comb. n.**

*Adelocera incerta* Fleutiaux, 1927 : 75.

LECTOTYPE (present designation). SOUTH VIETNAM: ♀, Cochinchine; voisin de *incertus*, Cand. vidit [Fleut.]; pres longus et hispidulus [Fleut.]; *Adelocera incerta* Fleut., Type [Fleut.] (MNHN, Paris).

***Agrypnus incurvatus* (Fleutiaux) comb. n.**

*Adelocera incurvata* Fleutiaux, 1927: 81.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Hoa Binh, Tonkin; Hoa Binh, Tonkin, de Cooman; 11; *Adelocera incurvata* Fleut., Type [Fleut.] (MNHN, Paris).

Paralectotypes. 1 ♀, same locality as the lectotype but without a determination label. 6 ex., Tonkin, Lac Tho, Hoa Binh, A de Cooman, one specimen bears Fleutiaux's determination label (MNHN, Paris).

***Agrypnus indosinensis* (Fleutiaux) comb. n.**

*Adelocera (Compsolacon) indosinensis* Fleutiaux, 1927 : 86.

*Compsolacon indosinensis* (Fleutiaux) Fleutiaux, 1947 : 286.

LECTOTYPE (present designation). LAOS: ♀, Muong Nga, Luang Prab. 13.3.18; Laos, Luang Prabang (environs), Vitalis de Salvaza; *Compsolacon indosinensis* Fleut. Type [Fleut.] (MNHN, Paris).

Paralectotype. NORTH VIETNAM: 1 ex., Env. de Lam (Tonkin) Blaise; *indosinensis* Fleut. [Fleut.] (MNHN, Paris).

***Agrypnus inductus* (Candèze) comb. n.**

*Lacon inductus* Candèze, 1888 : 668.

*Adelocera inductus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on a single specimen from Bhamo, Haut Birmanie [BURMA] collected in June by Fea.

Holotype: MCSN, Genoa.

The generic attribution is based on the description.

***Agrypnus indutissimus* (Candèze) comb. n.**

*Lacon indutissimus* Candèze, 1892a : 797.

*Adelocera indutissimus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on a single specimen from Kifa-juc [ENGGANO I.] collected by Modigliani in May-June 1891 and submitted to Candèze by Gestro.

Holotype: ?MCSN, Genoa.

The generic attribution is based on Candèze's comment that this species resembles *feralis* Candèze (see p. 154).

***Agrypnus inflatus* (Candèze) comb. n.**

*Lacon inflatus* Candèze, 1897 : 9.

*Adelocera inflatus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Mysore [INDIA].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on a specimen, which may be part of the syntype-series; INDIA: 1 ♀, Inde; *Lacon inflatus* Cand., Mysore [Cand.] Candèze det. [Fleut.] (MNHN, Paris).

***Agrypnus inops* (Candèze) comb. n.**

*Lacon inops* Candèze, 1874 : 67.

*Adelocera inops* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from 'Malacca, Siam and Borneo'. The IRSNB, Brussels does not contain any specimens from these localities (see p. 271). The only specimens under this name, a female from Cambodia with Candèze's yellow-bordered determination label and a male from the same locality, are not conspecific with the lectotype and belong to a species unknown to me.

LECTOTYPE (present designation). INDIA: ♀, India [Janson]; *L. inops* Cdz., type [Cand.]; *Lacon inops* Cand. type, India [Gahan]; Janson coll. ex Candèze, 1903.130 (BMNH). The discrepancy between the published locality and the label is probably due to Janson (see p. 276).

Paralectotype. BORNEO: ♀, Schwanez, Borneo; *L. inops* Cdz. type [Cand.] (RNH, Leiden).

***Agrypnus insignitus* (Candèze) comb. n.**

*Lacon insignitus* Candèze, 1874 : 98.

*Lacon insignitus* Candèze; Neboiss, 1956 : 9.

LECTOTYPE (present designation). AUSTRALIA: ♂, N. Holl. Q'land; *L. insignitus* [Janson] Cand. (Janson ms.) [Gahan]; *Lacon insignitus* Cand. type, Queensland [Gahan] (BMNH).

Paralectotype. 2 ♂, N. Holl. Q'land.; Janson coll. 1903 : 130; *Lacon insignitus* Cand. [Gahan]. One specimen bears Candèze's label: *L. insignitus* n.sp. (BMNH).

The wings and metasternum are much reduced in length.

***Agrypnus insularis* (Candèze) comb. n.**

*Lacon insularis* Candèze, 1874 : 74.

*Adelocera insularis* (Candèze) Fleutiaux, 1926 : 98.

The description is based on an unrecorded number of specimens of variable appearance from the Indian Archipelago, the Moluccas, New Guinea, Batchian and Malacca. Candèze comments that it was found often by Wallace.

Lectotype (designated by Van Zwaluwenburg, 1959 : 353). INDONESIA: ♂, C. W. Mysol; Janson coll. 1903.130; *insularis* [Cand.] (BMNH). In view of the fact that Candèze's second collection (see p. 171) is in the IRSNB, Brussels it is strange that Van Zwaluwenburg selected the specimen in the BMNH as the lectotype. However as it agrees with the description, comes from the published locality and bears Candèze's determination label, there is no justification for rejecting Van Zwaluwenburg's action.

Paralectotypes. Van Zwaluwenburg records that the lectotype is the first of nine specimens but he does not indicate whether he believes the remaining eight specimens to be part of the original syntype series. I have been able to discover only the following seven specimens from the type-localities in the BMNH. 1 ex., only right elytron remaining, labels as lectotype. 2 ♂, N.W. New Guinea/C.W.; Janson coll. 1903.130; *insularis* [Cand.] 2 ♀, same locality and collection, one bears a note 'pas de sillons' in Candèze's hand writing. ♀, Batchian/C.W. gl.; Janson coll. 1903.130; *Lacon insularis* Cand., named by Candèze [Gahan]. This specimen differs from the New Guinea females, which I believe to be correctly identified, in that there is no pore on the fourth visible abdominal sternite. It belongs to a species unknown to me. 1 ♀, Waigou/C.W.; Janson coll. 1903.130; *Lacon insularis* Cand., named by Candèze [Gahan]. This specimen also differs from the New Guinea specimens in that there is a pore on both the third and fourth visible abdominal sternite. It belongs to a species unknown to me (BMNH). 1 ♀, Malacca [sic]; *Lacon insularis* Cd. Molucc. [sic] [Candèze, yellow border]; Collection E. Candèze; *Lacon insularis* Cd. det. E. Candèze [IRSNB, Brussels curatorial label] (IRSNB, Brussels). The different localities on the two labels are probably due to an error in copying. The specimen measures 7.5 mm, compared with a published length of 5-6 mm. The fifth visible abdominal sternite bears a shiny patch and there is no pore on the fourth sternite. The specimen is not conspecific with the paralectotype from New Guinea in the BMNH. 1 ♂, Malacca Collection E. Candèze; *Lacon insularis* Cd. det. E. Candèze [IRSNB, Brussels curatorial label] (IRSNB), correctly identified.

The specimen (♀) from Sarawak [Borneo] (BMNH) recorded by Van Zwaluwenburg (loc. cit.) is correctly identified.

***Agrypnus insulsus* (Candèze) comb. n.**

*Tilotarsus* [sic] *insulsus* Candèze, 1895b : 57.

*Lobotarsus insulsus* (Candèze) Schwarz, 1906 : 30.

The description is based on an unrecorded number of specimens collected at Diego Suarez [MADAGASCAR] by Ch. Alluaud.

Type-material: ?MNHN, Paris and/or IRSNB, Brussels.

The generic attribution is based on the following specimen which may be a syntype; ♂, Museum Paris, Madagascar, Coll. Ch. Alluaud 1904; *Tilotarsus insulsus* Cand. Cand. det. 1895 (MNHN, Paris).

### ***Agrypnus intermedius* (Schwarz) comb. n.**

*Lacon intermedius* Schwarz, 1902b : 199.

*Adelocera intermedius* (Schwarz) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). BORNEO: ♂, N. Borneo; coll. Schwarz; Typus; *intermedius* Schw. [Schw.] (DEI, Eberswalde).

Paralectotypes. 1 ♂, Borneo, Kina Balu; coll. Schwarz; Typus ♀, N. Borneo; coll. Schwarz; Typus (DEI, Eberswalde). 1 ♂, Kina Balu; coll. Schwarz Typus. ♂, Borneo, Kina-Balu; Coll. Schwarz; Typus (DEI, Eberswalde). These two specimens are distinct species, which are not conspecific with the lectotype. They belong to species unknown to me.

### ***Agrypnus interpunctatus* (Klug) comb. n.**

*Elater (Agrypnus) interpunctatus* Klug, 1833 : 66 (1834 : 154).

*Adelocera interpunctatus* (Klug) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♂, 16104 [museum catalogue number = information on next label]; Madagasc. Goud. (NMHU, Berlin).

Paralectotype. ♂, Madagasc. Goud. Nr. 16104 (NMHU, Berlin). The specimens stand beside a blue label in Gerstaecker's handwriting: *interpunctatus* Cand. *Elater interpunctatus* Klug + Madag. Goud. The absence of Klug's determination label is probably due to Gerstaecker (see p. 275).

### ***Agrypnus irroratus* (Klug) comb. n.**

*Elater (Agrypnus) irroratus* Klug, 1833 : 65 (1834 : 153).

*Lacon irroratus* (Klug) Germar, 1840 : 265.

*Lacon confusus* Candèze, 1857 : 109, pars. [Synonymized by Candèze, 1874 : 53.]

*Adelocera irroratus* (Klug) Fleutiaux, 1826 : 99.

*Elater (Agrypnus) irroratus* Klug. LECTOTYPE (present designation). MADAGASCAR: ♂, Madag. Goudot, No. 16096 [museum catalogue number = Madagascar, collected by Goudot] (NMHU, Berlin).

Paralectotypes. 2 ♀, 16096; Madag. Goudot, No. 16096. 1 ♀, 16096; Madag. Goudot (NMHU, Berlin). The specimens stand beside a blue Gerstaecker label: *irroratus* Cand., *Elat. irroratus* Klug, Madagascar, Goudot. The absence of Klug's determination label is probably due to Gerstaecker (see p. 275).

*Lacon confusus* Candèze. The description is based on an unrecorded number of specimens from Madagascar received as *micans* from Klug and *binotatus* from Chevrolat. The length is recorded as 12–24 mm, but, as the corresponding widths are  $3\frac{1}{4}$ – $4\frac{3}{4}$  mm, it seems probable that the second measurement is a misprint, and should read 14 mm. Candèze (1874 : 53) synonymized *confusus* with *Lacon irroratus* Klug, which he believed to be very variable in size. Fleutiaux (1899 : 222) states that Candèze's *confusus* material consisted of two 'formes' (species in this context) and that the type of the larger one was in the MNHU, Berlin. I have not been able to find this specimen in the MNHU, Berlin collections. The BMNH contains a female bearing the following labels: Madagascar; Janson coll. ex. Candèze, 1903.130; *Lacon confusus* Cdz. Mad. Mnz. [Cand.]. The specimen is 14.5 mm long, agrees well with Candèze's description and is conspecific with the lectotype of *irroratus* Klug. If further searches fail to discover Klug's '*micans*' specimen, I suggest that this specimen be designated as the neotype of *Lacon confusus* Candèze.

The specimen which Fleutiaux regarded as the type of Candèze's smaller species is a male in his own collection (now in MNHN, Paris) bearing the following labels: *L. confusus* type, Mon. 1, p. 109, Fleut. Bull. Mus. 99 : 22 [Fleut.]. The specimen stands beside a Chevrolat collection label: *Lacon confusus* Cand. Mon. 1, 1857, p. 109.16. Madagascar. The specimen measures 11.5 mm and agrees with Candèze's description. Despite the fact that it lacks any kind of label indicating that it was Chevrolat's *binotatus*, I believe that it formed part of Candèze's original *confusus* material. It is not conspecific with *irroratus* Klug and belongs to a species unknown to me.

GERMAR'S INTERPRETATION OF *Lacon irroratus* (KLUG). Germar (1840 : 265) refers to Klug's description of *irroratus* but he does not record whether he saw Klug's material. The BMNH contains a male with the following labels: *irroratus* Kl. Madag. [Germar]; Janson coll. ex. Schaum, 1903.130; Md. [mss. on triangular blue label]; 1015. I believe that this specimen, which is conspecific with the lectotype of *irroratus* Klug, is that on which Germar based his interpretation of the species.

### ***Agrypnus jansonii* (Fairmaire) comb n.**

*Lacon jansonii* Fairmaire, 1871 : 40.

*Adelocera jansonii* (Fairmaire) Fleutiaux, 1926 : 96.

The description was based on two specimens, one from Bourbon [REUNION] in the de la Ferté collection, which Fairmaire states Candèze believed to be a variety of *L. irroratus* (as *virroratus*, a misprint) and a second specimen in the same collection labelled Madagascar in Coquerel's hand. I have not been able to find these specimens, which should be in the BMNH. If Fairmaire acquired these specimens they may now be in the MNHN, Paris or IRSNB, Brussels, see p. 275.

The generic attribution is based on the following specimen: 1 ♀, Madagascar.

Diego Suarez 3, Ch. Alluaud, 1893; *L. jansoni* Fairm. [Cand.] Cand. det. 1895 [Fleut.] (MNHN, Paris).

***Agrypnus judex* (Candèze) comb. n.**

*Lacon judex* Candèze, 1874 : 62.

*Adelocera judex* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). CHINA: ♀, Shanghai [Janson]; Janson coll. 1903 : 130; *L. judex* Cdz. [Cand.]; *L. judex* Cand. Type [Gahan] (BMNH).

***Agrypnus jurulosus* (Candèze) sp. rev., comb. n.**

*Lacon jurulosus* Candèze, 1889 : 73.

The description is based on an unrecorded number of specimens from SIKKIM, Himalaya. I have been unable to find this material in the IRSNB, Brussels or elsewhere.

Schenkling (1925 : 27) records this species as a synonym of *truncatus* Herbst, but without giving any reason for doing so. Since Candèze implies that the species bears a resemblance to *L. coctus* Candèze, I believe Schenkling's synonymy to be erroneous.

The generic attribution based on the following specimen; INDIA: ♀, Kullu, 1019.6; *jurulosus* Cand. Beng. Barwai C. [Candèze, yellow border]; Collection E. Candèze; *jurulosus* Cd. det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels). This may be one of the large number of specimens recorded by Candèze (1892 : 484). It is not conspecific with *truncatus* Herbst.

***Agrypnus kenyensis* (Fleutiaux) comb. n.**

*Lacon kenyensis* Fleutiaux, 1919 : 18.

*Adelocera kenyensis* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). KENYA: ♂, Afr. or. Anglaise, Mt. Kenya vers ouest, Zone de Forêts, Alluaud & Jeannel; Forêts inferieure, Podocarpus, 2400 m, Jan., Fevr. 1912, st. 39; *Lacon kenyensis* Fleut. type. Voy. All. Jeann. Afr. or. Elat. p. [Fleut.] (MNHN, Paris).

Paralectotypes. 9 ex., same locality as the lectotype, 2 specimens bear Fleutiaux's determination label (MNHN, Paris). 1 ex., Afr. or. Anglaise, Mt. Kenya vers ouest. Zone de forêts, Alluaud & Jeannel; Praires découvertes entre les rivières Amboni et Narémuru (Abt. 1800–2000 m) jan–fev. 1912, st. 30 et 50; *Adelocera* (*Lacon*) *kenyensis* Fleut. [Fleut.] (BMNH). 7 ex. Museum Paris, Afr. Orient. Angl. Escarpment (Wa Kikou-you) [Kikuyu in description] Ch. Alluaud. One specimen bears the date 'Aout' and two others Fleutiaux's determination label (MNHN, Paris). Fleutiaux recorded 8 specimens from Kikuyu, but only 7 examples have been located.

***Agrypnus kinangopa* (Fleutiaux) comb. n.**

*Adelocera kinangopa* Fleutiaux, 1935e : 92.

LECTOTYPE (present designation). KENYA: ♀, Turner, Kinangop, March, 30; Museum Nairobi; *Adelocera* (Lacon) *Kinangopa* Fleut. Type [Fleut.] (MNHN, Paris).

Paralectotypes. 2 ex., same locality as lectotype, with Fleutiaux's determination label (MNHN, Paris, NM, Nairobi).

***Agrypnus labiosus* (Candèze) comb. n.**

*Lacon labiosus* Candèze, 1874 : 86.

*Adelocera* (*Compsolacon*) *labiosus* (Candèze) Van Zwaluwenburg, 1959 : 353.

Lectotype (designated by Van Zwaluwenburg, 1959 : 353). AUSTRALIA: ♂, W. Australia/Fremantle [Janson]; Janson coll. 1903.130; *Lacon labiosus* Cand. Type [Gahan]; *Lacon* sp. nov., impressions tarsals sur le pro et metathorax. *L. labiosus* mihi. Champion Bay [28°44'S., 113°36'E.] and Fremantle, W. Australia [Janson] (BMNH).

Paralectotype. ♀, W. Australia/Fremantle; Janson coll. 1903.130; *Lacon labiosus* Cand. cotype [Gahan] (BMNH).

The published locality is Swan Riv. Fremantle lies at the mouth of the Swan River. The discrepancy between the published locality and the label is probably due to Janson (see p. 276).

The description is misleading as it suggests that the tarsal grooves are deep with well defined margins as in *caliginosus*. In fact, true grooves are absent, their place being taken by depressions without well defined margins. The sides and base of the depressions resemble the surface of the underside, being punctured and clothed with scales.

***Agrypnus lacrymosus* (Candèze) comb. n.**

*Lacon lacrymosus* Candèze, 1874 : 96.

*Lacon lacrymosus* Candèze; Neboiss, 1956 : 9.

LECTOTYPE (present designation). AUSTRALIA: ♀, Janson coll. 1903.130; *lacrymosus* Cdz. Type [Cand.]; *Lacon lacrymosus* Cand. S. Australia [Gahan] (BMNH).

Paralectotype. ♀, South Australia, C.W.; Janson coll. 1903.130; *L. lacrymosus* Cdz. [Cand.] (BMNH).

The description is based on material in the Janson and Candèze collections. The IRSNB, Brussels may possess additional paralectotype material.

***Agrypnus lakhoni* nom. n.**

*Adelocera* (*Archontas*) *subtuberculata* Fleutiaux, 1927 : 83, pl. 1, fig. 2.

*Archontas subtuberculata* (Fleutiaux) Fleutiaux, 1947 : 281. [Junior secondary homonym of

*Agrypnus subtuberculatus* (Schwarz, 1898a).]

LECTOTYPE (present designation). LAOS: ♂, Mt. Laos; *Adelocera subtuberculata* Fleut. Type [Fleut.]; sp. ?Ht. Laos, Vitalis; type de la fig. [Fleut.] (MNHN Paris).

Paralectotypes. 2 ♂, 2 ♀, same locality as the lectotype. One specimen of each sex bears Fleutiaux's determination label (MNHN, Paris).

I have not seen the material from the second recorded locality, Lakhon (*Harmand*).

***Agrypnus lameyi* (Fleutiaux) comb. n.**

*Adelocera (Compsolacon) lameyi* Fleutiaux, 1927 : 85.

[*Lacon muticus* Herbst; Fleutiaux, 1918d : 194. Misidentification.]

*Compsolacon lameyi* (Fleutiaux) Fleutiaux, 1947 : 287.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Hoa Binh, Cooman; *Compsolacon lameyi* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 1 ex., Hagiang, Tonkin, Vitalis; *Lacon muticus* Hbst., Cand., Fl. 1918 [Fleut.]; *Compsolacon lameyi* Fleut., *muticus* Fleut, 1918 non Hbst. [Fleut.]. 1 ex. [illegible ? Ha-Lang] Lamey; *Lacon musculus* Cand.; *Lacon muticus* Hbst., Cand. [Fleut.] (MNHN, Paris).

***Agrypnus lapideus* (Candèze) comb. n.**

*Lacon lapideus* Candèze, 1857 : 141.

*Compsolacon lapideus* (Candèze) Fleutiaux, 1947 : 286.

LECTOTYPE (present designation). INDIA: ♂, India: Janson coll. 1903.130; *Lacon lapideus* Cdze. Type e coll. Schaum [Janson]; *lapideus* [Cand., stuck to underside of Janson label]; India or. [Cand., stuck to underside of Janson's label] (BMNH).

The published locality is 'Indes Orientales', see p. 271.

***Agrypnus lateralis* (Schwarz) comb. n.**

*Lacon lateralis* Schwarz, 1903b : 381.

*Adelocera (Compsolacon) lateralis* (Schwarz); Van Zwaluwenburg, 1966 : 298.

The description is based on an unrecorded number of specimens from 'AUSTRALIA' submitted to Plason by Vienna.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the description.

***Agrypnus laticollis* (Candèze) comb. n.**

*Lacon laticollis* Candèze, 1857 : 146; pl. 2, fig. 12.

*Lacon laticollis* (Candèze); Neboiss, 1956 : 9.

LECTOTYPE (present designation). AUSTRALIA: ♂, Australia; Janson coll.,

ex Candèze, 1903.130; *Lacon laticollis* Cdz. A. Thory [Cand.]; *Lacon laticollis* Cand. Type ex coll. Candèze [Gahan] (BMNH).

Paralectotype. ♀, N. Holl.; 18; *laticollis* Ch. v. Poll, *L. laticollis* [Cand.]: Coll. Chevrolat: *laticollis* Cand., typ. mon. [Fleut.] (MNHN, Paris).

***Agrypnus latiusculus* (Candèze) comb. n.**

*Lacon latiusculus* Candèze, 1878 : LIII (7).

*Adelocera latiusculus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Madagascar.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: MADAGASCAR: ♀, *latiuscula* Cand., comparé au type, Fleut. [Fleut.] (MNHN, Paris).

***Agrypnus latus* (Candèze) comb. n.**

*Lacon latus* Candèze, 1857 : 136.

*Lacon flavipes* Candèze, 1857 : 137; pl. 2, fig. 14. **Syn. n.**

*Lacon maillardi* Deyrolle, 1862 : 4; pl. 20, fig. 2. [Synonymized with *flavipes* Candèze, by Candèze, 1891c : 19.]

*Adelocera latus* (Candèze) Fleutiaux, 1926 : 96.

*Lacon latus* Candèze. LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar; *latus* Cdz. Mad. Coll. Mn. [Cand.]; *Lacon latus* Cand., det. E. Candèze [IRSNB curatorial label]; Collection Candèze (IRSNB, Brussels).

Paralectotype: ♂, Dej. Madagascar; Janson coll. 1903.130; *Lacon latus* Cdze. Cand. type [Janson]; *Agrypnus gravis* Dej. Cat. e coll. Dej. [Janson] *latus* [Cand.] (BMNH).

*Lacon flavipes* Candèze. Holotype. ♂, Laf. Madagascar; Janson coll. 1903.130; *Lacon flavipes* Cdze. Cand. Type e coll. de LaFerté [Janson]; *L. flavipes* voisin de *latus* Cand. [Cand.] (BMNH). Candèze states that the specimen has lost all the scales covering the body. Cleaning of the specimen has shown that it is clothed with narrow scales, many of which have been lost.

*Lacon maillardi* Deyrolle. LECTOTYPE (present designation). REUNION: ♀, *Lacon maillardi* Deyr. Bourbon [believed to be Deyrolle's handwriting]; Janson coll. 1903.130 (BMNH).

***Agrypnus lavaudeni* (Fleutiaux) comb. n.**

*Adelocera* (*Lacon* des Auteurs) *lavaudeni* Fleutiaux, 1932c : 153.

LECTOTYPE (present designation). MADAGASCAR: ♀, Forêt de Tempina, Est Madagascar, sud Tamatave, Lavauden; *Adelocera* (*Lacon*) *lavaudeni* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus laxatus* (Candèze) comb. n.**

*Lacon laxatus* Candèze, 1895b : 56.

*Adelocera laxatus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Diego Suarez, Ch. Alluaud 1893; Museum Paris, Madagascar, coll. Alluaud 1903; *L. laxatus* n.sp. Cand. det. 1893 [Cand.] (MNHN, Paris).

Paralectotypes. 1 ♂, 3 ex., same locality and collection as the lectotype. All bear Fleutiaux's determination labels and one bears an additional label: *Lacon laxatus* Cand. Ann. Belge 1859 p. 56 ex type [Fleut.] (MNHN, Paris).

The published locality is Montagne des Français, 600–800 m.

***Agrypnus leprosus* (Candèze) comb. n.**

*Lacon leprosus* Candèze, 1857 : 107; pl. 11, fig. 3.

*Adelocera leprosus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens with a reference to *Agrypnus hydropictus* Dup. in Dej. cat. ed. 3 : 99, and a specimen in the MNHU, Berlin named *leprosus* by Klug. The designation of a lectotype is postponed until any material extant in the MNHU, Berlin can be examined.

Syntype examined. MADAGASCAR: ♂, Dej. Madagascar; Janson coll. 1903.130; *Lacon leprosus* Cdze. [Janson]; *Agrypnus hydropictus* Dej. Cat. e coll. Dejean [Janson]; *L. leprosus* [Cand.] (BMNH).

***Agrypnus leucaspis* (Candèze) comb. n.**

*Lacon leucaspis* Candèze, 1874 : 63.

*Adelocera leucaspis* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens collected in Malacca by Castelnau, in the Janson and Candèze collections. Selection of a lectotype is postponed until any material extant in the Candèze collection (IRSNB, Brussels) can be examined.

Syntypes examined. 1 ex., no locality label. Janson coll. 1903.130; *L. leucaspis* Cdz. Type [Cand.]. The abdomen is missing. 1 ♀, Malacca; Janson coll. 1903.130; *L. leucaspis* Cdz. [Cand.]. 1 ♂, 1 ♀, Malacca, Janson coll. 1903.130 (BMNH).

***Agrypnus lezeleucii* (Candèze) comb. n.**

*Lacon lezeleucii* Candèze, 1857 : 158.

*Colaulon lezeleuci* (Candèze) Golbach, 1968 : 198.

LECTOTYPE (present designation). MEXICO: ♀, labelled as ♂, Laf. Vera Cruz, Mex.; Janson coll. 1903.130; *Lacon lezeleucii* Cand. type, e coll. de Laferté [Janson] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

Paralectotype. ♂, labelled as ♀, Laf. Vera Cruz, Mex.; *Lacon lezeleucii* Cand. Cand. e coll. de Laferté [Janson]; Vera Cruz, *lezeleucii* [?Cand.] (BMNH). The error in the determination of the sex is due to Champion (1894 : 263) (see p. 117).

***Agrypnus limosus* (Candèze) comb. n.**

*Lacon limosus* Candèze, 1882 : 10.

*Adelocera limosus* (Candèze) Fleutiaux, 1927 : 96.

The description is based on an unrecorded number of specimens from New Guinea.

Type-material; ?IRSNB, Brussels.

Generic attribution is based on the following specimen; NEW GUINEA: Papua; Kokoda, 1200 ft, VII.33, determined by Van Zwaluwenburg (BMNH).

***Agrypnus lindensis* (Blackburn) comb. n.**

*Lacon lindensis* Blackburn, 1892a : 504.

*Adelocera lindensis* (Candèze); Van Zwaluwenburg, 1959 : 352.

Lectotype (designated by Van Zwaluwenburg, 1959 : 352). ♀, 89I, T [on card mount, see p. 270]; *Lacon lindensis* Blackb. [Blackb.] (BMNH).

Paralectotypes. An unknown number of cotypes in the SAM, Adelaide recorded by Neboiss (1956 : 9).

The published locality is 'South Australia; not rare near Port Lincoln, under bark of *Eucalyptus*'.

***Agrypnus lolodorfensis* nom. n.**

*Lobotarsus decoratus* Schwarz, 1898a : 131.

*Agrypnus decoratus* (Schwarz) **comb. n.** [Junior secondary homonym of *Agrypnus decoratus* (Candèze, 1881).]

The description is based on an unrecorded number of specimens collected in Kamerun, Lolodorf by Conrad and submitted by Kraatz.

LECTOTYPE (present designation). CAMEROUN: ♀, Kamerun; coll. Schwarz; histor Exempl. vielleicht Type [printed] *decoratus* Schw. [Schw.] (DEI, Eberswalde).

***Agrypnus longicornis* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *longicornis* Fleutiaux, 1934b : 52.

LECTOTYPE (present designation). MADAGASCAR: ♀, Manandriana, G. Olsoufieff; *Adelocera longicornis* Fleut. Type [Fleut.] (MNHN, Paris).

Paralectotype. ♂, Tananarive, G. Waterlot, 1919; *Adelocera* (*Archontas*) *longicornis* Fleut. [Fleut.] (MNHN, Paris).

***Agrypnus longipennis* (Schwarz) comb. n.**

*Lacon longipennis* Schwarz, 1899 : 130.

*Adelocera longipennis* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Madagascar.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen: ♂, MADAGASCAR, compared with the type by Fleutiaux (MNHN, Paris).

***Agrypnus longus* (Fleutiaux) comb. n.**

*Lacon longus* Fleutiaux, 1903a : 571.

*Archontas longus* (Fleutiaux) Fleutiaux, 1947 : 281.

LECTOTYPE (present designation). SOUTH VIETNAM: ♀, Cochin China; *Lacon longus* Fleut. Type [Fleut.]; *Lacon longus* Fleut., type, Ann. Soc. ent. Fr. 1902 : 571 [Fleut.] (MNHN, Paris).

***Agrypnus lopezi* (Fleutiaux) comb. n.**

*Adelocera* (ex *Lacon*) *lopezi* Fleutiaux, 1934c : 477.

LECTOTYPE (present designation). PHILIPPINES: ♂, La Carlotta, Occ. Negros P.I.; vi.i.31; Al. Lopez, collector; F. C. Haddon collection; *lopezi* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes: 1 ♀, same locality, collector and collection labels but without a determination label (MNHN, Paris). An unknown number of specimens in the HSPA, Honolulu.

***Agrypnus luctus* (Fleutiaux) comb. n.**

*Tylotarsus Lobitarsus* (sic) *luctus* Fleutiaux, 1935c : 92.

LECTOTYPE (present designation). KENYA: ♂, Lower Tana, Sabaki, avril-mai (Turner & Macarthur); *luctus* Fleut. type [Fleut.] (MNHN, Paris).

***Agrypnus lupinosus* (Candèze) comb. n.**

*Lacon lupinosus* Candèze, 1857 : 130.

*Sagojo* [sic] *lupinosus* (Candèze) Ohira, 1971c : 66.

Holotype. ♂, Laf. Ind. Bor. Bacon [Janson]; Janson coll. 1903 : 130; *lupinosus* Cdz. type [Cand.]; 47; *Lacon lupinosus* Cdze. Cand. Type e coll. de Laferté [Janson] (BMNH).

The published locality is 'Indes-Orientales boreales', see p. 171.

***Agrypnus lustratus* (Candèze) comb. n.**

*Lacon lustratus* Candèze, 1890 : cxlix.

*Adelocera lustratus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens collected in Chota Nagpore by Cardon (see p. 273).

Syntypes examined. INDIA: 1 ex., 13394 [Fry catalogue number = *Lacon lustratus* Cand. determined by Cand., India or. Chota Nagpore, received from Donkier, Dec. 1895]. Chota Nagpur; India orient.; Fry coll. 1905.100. 1 ♂, Chota Nagpur, India orient.; Fry coll. 1905 : 100; *Lacon lustratus* (BMNH). 1 ex., *lustratus* n.sp. Cand. det. [Fleut.]; Chota Nagpore, Bengale; Cand. C. R. Soc. Ent. Belge, 1890 : 149, Ann. Soc. Ent. Belge, 1892 : 454. 1 ex, *lustratus* Cand. Chota Nagpore, Bengale. 10 ex, Chota N. Bengale (MNHN, Paris). The selection of a lectotype is postponed pending further study of the material.

***Agrypnus lutosus* (Candèze) comb. n.**

*Lacon lutosus* Candèze, 1857 : 119.

*Adelocera lutosus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from 'des Indes orientales' (see p. 271) in the Schaum collection. As the species is not recorded in the BMNH manuscript catalogue of the Schaum collection, it is assumed to be lost. For the history of the Schaum collection see p. 280.

The generic attribution is based on the following specimen: NEPAL: ♂, Hardwicke, Nepal; *lutosus* Cdz. [Cand.] (BMNH).

***Agrypnus macgregori* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *macgregori* Fleutiaux, 1934e : 364.

LECTOTYPE (present designation). PHILIPPINES: ♀, 'Culasi, Panay, 24 May' 18. P. I. R. C. McGregor; *Adelocera macgregori* Fleut. Type [Fleut.] (MNHN, Paris).

***Agrypnus macroderus* (Candèze) comb. n.**

*Lacon macroderus* Candèze, 1865 : 10.

*Adelocera macroderus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). BATJAN: ♂, Batchian; Janson coll. ex Candèze 1903.130; *Lacon macroderus* Cdz. suppl. Batchian [Cand.]; *Lacon macroderus* Cdz. Type ex coll. Cand. [Janson] (BMNH).

Paralectotypes. 1 ♀, Batchian; Janson coll. 1903.130. 1 ♀, Batchian, C.W.; Janson coll. 1903.130. 1 ex, Bac.; *L. macroderus* Cdz. E. N.; Janson coll. 1903.130 (BMNH).

***Agrypnus maculosus* (Macleay) sp. rev., comb. n.**

*Lacon maculatus* Macleay, 1872 : 251.

The description is based on an unrecorded number of specimens collected at Gayndah [AUSTRALIA, Queensland] by Masters.

Type-material: AM, Sydney, according to Neboiss (1956 : 8).

According to Lea (1920 : 379) the type is a rather small specimen of *L. guttatus* Candèze (see p. 161), a species described from Melbourne, Victoria. I have not had the opportunity of examining Macleay's material to confirm the synonymy.

The generic attribution is based on Lea's proposed synonymy.

***Agrypnus maculatus* (Candèze) comb. n.**

*Lacon maculosus* Candèze, 1874 : 53.

*Lacon maculatus* Brancsik, 1893 : 234. [Unjustified emendation.]

*Adelocera maculosus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♀, Laf. Madagascar; Mad.; Coquerel; nov.sp. Madag.; Janson coll. 1903.130; *Lacon maculosus* Cand. type [Gahan]; *maculosus* Cdz. type [Candèze] (BMNH).

***Agrypnus madecassus* (Fleutiaux) comb. n.**

*Adelocera madecassa* Fleutiaux, 1932e : 153.

LECTOTYPE (present designation). MADAGASCAR: ♀, Forêt de Tempina, Est. Madag. Sud Tamatave, Lavauden; *Adelocera madecassa* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus major* (Candèze) comb. n.**

*Tilotarsus major* Candèze, 1857 : 172.

Holotype. MADAGASCAR: ♂, Madagascar; Janson coll. 1903.130; *major* Cdze, Type (e coll. de Mniszech) [Janson] (BMNH). The absence of a Candèze determination label is probably due to Janson (see p. 276).

***Agrypnus mamillatus* (Candèze) comb. n.**

*Lacon mamillatus* Candèze, 1857 : 144; pl. 2, fig. 4.

*Lacon mamillatus* Candèze; Neboiss, 1956 : 10.

Holotype. AUSTRALIA: ♀, Laf. Nov. Holl.; Janson coll. 1903.130; *L. mamillatus* Cand. type [Cand.]; *Lacon mamillatus* Cdze Cand. type (e coll. de Laferté) [Janson] (BMNH).

***Agrypnus mansuetus* (Blackburn) comb. n.**

*Lacon mansuetus* Blackburn, 1892b : 288.

*Adelocera (Compsolacon) mansueta* (Blackburn); Van Zwaluwenburg, 1959 : 353.

Lectotype (designated by Van Zwaluwenburg, 1959 : 353, see p. 9). AUSTRALIA: ♂, 4393, Narr. T. [on card mount, see p. 270]; Australia, Blackburn Coll.; *Lacon mansuetus* Blackb. [Blackb.] (BMNH).

Paralectotypes. An unrecorded number of paratypes (cotypes) in SAM, Adelaide, recorded by Neboiss (1961 : 6).

The published locality is N. S. Wales, taken by Mr Musson near Narrabri.

The wings and metasternum are much reduced in length.

***Agrypnus marginatus* (Candèze) comb. n.**

*Lacon marginatus* Candèze, 1874 : 91.

*Lacon marginatus* Candèze; Neboiss, 1956 : 10.

LECTOTYPE (present designation). AUSTRALIA, N.S.W.: ♂, Clarence River; *marginatus* Cdz., Clar. Riv. [Candèze, red border]; Collection E. Candèze; *Lacon marginatus* Cd. det. E. Candèze [IRSNB, curatorial label] (IRSNB, Brussels).

Paralectotypes. AUSTRALIA, N.S.W.: 2 ♂, Clarence River; Collection E. Candèze; *Lacon marginatus* Cd., det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

The BMNH collection contains a pin with the following labels: Janson coll. 1903.130; *Lacon marginatus* Cand. Clarence River [?Gahan]; *L. marginatus* Cdz., type [Cand.]. The specimen is missing and there are no additional specimens from the Janson collection from the type-locality which agree with the description.

***Agrypnus marmoratus* (Candèze) comb. n.**

*Lacon marmoratus* Candèze, 1874 : 94.

*Adelocera (Compsolacon) marmorata* (Candèze); Van Zwaluwenburg, 1959 : 354.

Lectotype (designated by Van Zwaluwenburg, 1959 : 354, see p. 9). AUSTRALIA: ♀, Janson coll. 1903.130; *marmoratus* Cdz. type [Cand.]; *Lacon marmoratus* Cand., Queensland [Gahan] (BMNH).

Since Candèze described this species after 1869 and states that it forms part of his collection, I would have expected to find the material in the IRSNB (see p. 271). However since Van Zwaluwenburg made this designation after examining both collections I have accepted his decision.

***Agrypnus melancholicus* (Candèze) comb. n.**

*Lacon melancholicus* Candèze, 1890 : CXLVIII.

*Adelocera melancholicus* (Candèze) Fleutiaux, 1926 : 98.

LECTOTYPE (present designation). INDIA: ♀, Nagpore; *melancholicus* Cand. Nagpore, P.C. [Candèze, yellow border]; *Lacon melancholicus* Cd., det. E. Candèze [IRSNB curatorial label]; Collection E. Candèze (IRSNB, Brussels).

Paralectotype: ♀, Nagpore; *Lacon melancholicus* Cd. det. E. Candèze [IRSNB curatorial label]; Collection E. Candèze (IRSNB, Brussels).

Candèze based his description on four specimens. I have been unable to trace the remaining two paralectotypes.

Candèze (1892 : 484) recorded this species as rare in Konbir, but found in large numbers at Barwai. The IRSNB, Brussels collection contains a single female labelled Barwai, Chota Nagpore, 1892 and 10 females from Nagpore with IRSNB curatorial labels *Lacon melancholicus* Cd. det. E. Candèze. These specimens are not conspecific with the lectotype. They are all *Agrypnus truncatus* (Candèze), see p. 223).

***Agrypnus meridionalis* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *meridionalis* Fleutiaux, 1934b : 58.

LECTOTYPE (present designation). MADAGASCAR: ♀, Madagascar, Reg. Sud de l'Isle; Ihosy, 2.33, A. Seyrig; *meridionalis* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes. 11 ex., with the same locality labels as the lectotype (MNHN, Paris). 1 ♀, Madagascar; Ihosy; *Adelocera* (*Lacon*) *meridionalis* Fleut. [Fleut.] (BMNH).

***Agrypnus minimus* (Candèze) comb. n.**

*Lacon minimus* Candèze, 1895 : 57.

*Adelocera minimus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. MADAGASCAR: ♂, Madagascar, Diego Suarez, Ch. Alluaud; Museum Paris, Madagascar, Coll. Ch. Alluaud 1904; *L. minimus* n.sp. Cand. det. [Cand.] (MNHN, Paris).

***Agrypnus minor* (Candèze) comb. n.**

*Lacon minor* Candèze, 1857 : 126.

*Adelocera minor* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar; Janson coll. ex Candèze 1903.130; *Lacon minor* Cdz. Mad. [Cand.] (BMNH).

Paralectotypes. 2 ♂, 1 ♀, Dej. Madagascar; Janson coll. 1903.130; *Lacon minor* Cand. e coll. Dejean [Janson]. One specimen bears the word 'Type' on Janson's determination label (BMNH).

Candèze comments that there is material belonging to this species standing as *pumilo* Kl. (in litt.) in the ZMHU, Berlin, and as *gibbicollis* (in litt.) in the Chevrolat collection (MNHN, Paris). I have not examined these specimens.

***Agrypnus minutus* (Schwarz) comb. n.**

*Lobotarsus minutus* Schwarz, 1898a : 133.

The description is based on an unrecorded number of specimens collected in KAMERUN by Conrad and submitted by Kraatz.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen: ♀ SIERRA LEONE, Rhobomp, determined by Fleutiaux (MNHN, Paris).

***Agrypnus mixtus* (Candèze) comb. n.**

*Lacon mixtus* Candèze, 1888 : 669.

*Adelocera mixtus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on a single specimen collected at Kawkareet, Tenasserim [BURMA] in May by Fea.

Holotype. MCSN, Genoa (see p. 275).

The generic attribution is based on the description.

***Agrypnus miyakei* Ohira**

*Agrypnus miyakei* Ohira, 1967b : 100.

Holotype. JAPAN: ♂, Amami-Oshima (Hatsuno), 30.iii.1964, Y. Miyake, Ohira collection.

Paratypes. 2 ♀, ditto, 14.IV.1964, J. Nagao, Tokuno-Shima (Kamezu), 22.IV.1964, K. Arichi [sic]. This material is in the collection of the Entomological laboratory, Ehime University and/or Nagao, Satô, Shibata and Kishii collections.

I have not examined this material; the generic attribution is based on the description.

***Agrypnus miyakoensis* (Ohira) comb. n.**

*Colaulon (Cryptolacon) miyakoensis* Ohira, 1969a : 93.

Holotype. JAPAN: ♀, Miyako-Jima, 26.VII.1965, H. Yamazaki, Ohira coll. The generic attribution is based on the description.

***Agrypnus miyamoti* (Nakane & Kishii) comb. n.**

*Cryptolacon miyamoti* Nakane & Kishii, 1955 : 2.

*Colaulon (Cryptolacon) miyamoti* (Nakane & Kishii) Kishii, 1964 : 23.

The description is based on a holotype, allotype and 50 paratypes from two localities in the Tokara Islands [Japan].

Type-material: Osaka Municipal Museum of Natural History, Entomological Laboratory of the Kyushu University and in the authors own collections. Not examined. The location of the individual specimens is not recorded but as the authors record the data on each specimen there should be no difficulty in recognizing them.

The generic attribution is based on the description.

***Agrypnus mjobergi* (Elston) comb. n.**

*Lacon mjobergi* Elston, 1930 : 5.

The description is based on an unrecorded number of specimens from AUSTRALIA, Queensland, Cedar Creek (Dr *Mjöberg*).

Elston states that the type is in the NR, Stockholm but unless that museum received only one specimen of the species this cannot be accepted as a valid holotype designation. Neboiss (1952 : 10) records the presence of an unrecorded number of paratypes in the AM, Sidney.

The generic attribution is based on Elston's statement that the species resembles *L. marmoratus* Candèze (= *Agrypnus marmoratus* (Candèze), see p. 181).

***Agrypnus mocquerysi* (Fleutiaux) comb. n.**

*Adelocera mocquerysi* Fleutiaux, 1932a : 50.

Holotype. MADAGASCAR: ♀, Madagascar, Baie d'Antongil, A. Mocquerys: Type: *Adelocera mocquerysi* Fleut., Type [Fleut.] (MNHN, Paris).

***Agrypnus modestus* (Candèze) comb. n.**

*Lacon modestus* Candèze, 1857 : 118.

*Adelocera modestus* (Candèze) Fleutiaux, 1926 : 97.

LECTOTYPE (present designation). JAVA: Dej. Java [Janson]; Janson coll. 1903 : 130; *Lacon modestus* Cdz. Cand. type (*Agrypnus modestus* Dej. coll.) e coll. Dejean [Janson] (BMNH).

The description is based on material standing as *Agrypnus modestus* Dej. in the de la Ferté Senéctère collection. The absence of Candèze's determination label and a label indicating that it came from the de la Ferté Senéctère collection is probably due to Janson (see p. 276).

***Agrypnus molestus* (Candèze) comb. n.**

*Lacon molestus* Candèze, 1857 : 120.

*Adelocera molestus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: ♂, Deyr. Dinapore, Ind. Or. [Janson]; 289; Janson coll. 1903.130; *L. molestus* Cand. type [Cand.]; *Lacon molestus* Cdz e coll. Deyrolle [Janson] (BMNH).

The published locality is 'Dinapore, aux Indes-Orientales' (see p. 271). There is a town of this name in the State of Bihar. In this case 'Indes-Orientales' may be a misprint for 'Inde orientale'. There are no subsequent records of this species.

***Agrypnus molitor* (Candèze) comb. n.**

*Lacon molitor* Candèze, 1875 : CXIX.

*Adelocera molitor* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Mindanao; côte S-O [PHILIPPINES].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on Candèze's comment that this species resembles *setiger*, *judex*, *multiforis* and *fibrinus* (q.v.).

***Agrypnus mozambicana* (Fleutiaux) comb. n.**

*Adelocera* (*Lacon* auct.) *mozambicana* Fleutiaux, 1932b : 3.

Holotype. MOZAMBIQUE: ♂, Museum Paris, Mozambique, Beira, P. Lesne, 1928; Decembre; *Adelocera* (*Lacon*) *mozambicana* Fleut. type [Fleut.] (MNHN, Paris). This is an *Agrypnus* species, despite the fact that Fleutiaux compares it with *Adelocera aethiopicus* (Candèze).

***Agrypnus mucoreus* (Candèze) comb. n.**

*Tilotarsus* [sic] *mucoreus* Candèze, 1857 : 173.

LECTOTYPE (present designation). MADAGASCAR: ♂, 16084 [museum catalogue number, refers to locality and collector on following label]; Madagascar, Goud.; *mucoreus* Cand. Madag. Goud. [Gerstaecker] (NMHU, Berlin).

The absence of Candèze's determination label is probably due to Gerstaecker (see p. 275). The lectotype measures 15.5 mm compared with the published length of 18 mm.

Paralectotypes: 1 ♂, 1 ♀, Madagascar Goud., No. 16084 (NHHU, Berlin). 1 ♂, Madagascar; Janson Coll. 1903.130; *Tilotarsus mucoreus* Cdze. ex coll. de Mniszech [Janson] (BMNH). The absence of Candèze's determination label on the BMNH specimen is probably due to Janson (see p. 276). The males measure 17 mm and the female 16.5 mm.

Fleutiaux (1899 : 223) states that *pulvereus* Candèze is an immature specimen of this species but comparison of the lectotypes has shown that this is not the case.

***Agrypnus multiforis* (Candèze) comb. n.**

*Lacon multiforis* Candèze, 1857 : 117.

*Adelocera multiforis* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). E. PAKISTAN: ♀, Sylhet [Janson]; Janson coll. 1903.130; *Lacon multiforis* Cdz. Sihlet [sic, Cand.]; *Lacon multiforis* Cdze Type (ex coll. Cand.) [Janson] (BMNH).

The published locality is 'Indes-Orientales' see p. 271.

*Agrypnus murinus* (Linnaeus)

*Elater murinus* Linnaeus, 1758 : 406, no. 19.

*Agrypnus murinus* (Linnaeus) Eschscholtz, 1829 : 32.

*Lacon murinus* (Linnaeus) Germar, 1840 : 264.

*Adelocera mucorea* LeConte, 1853 : 491. [Synonymized by Buysson, 1893 : 20.]

*Lacon sordidus* Candèze, 1857 : 114. [Synonymized by Fleutiaux, 1926 : 99.]

*Agrypnus murinus* (Linnaeus); Lane, 1953 : 88.

*Elater murinus* Linnaeus. LECTOTYPE (present designation). ♀, 19 murinus [Linnaeus] (Linnean Society collection, BMNH). The published locality is 'EUROPE'.

The Linnean collection contains two additional specimens, both correctly identified. The first, a male bears a printed number '28' presumably referring to Linnaeus, 1788 : 655 in which *murinus* is listed as number 28. The third specimen bears a manuscript label 'Angl. J.E.S.' and was presumably added by J. E. Smith, one-time owner of the Linnean collection.

Examination of the material standing as *murinus* Linnaeus in the BMNH, IRSNB, Brussels and MNHN, Paris has shown that collectors and authors have interpreted the species correctly. It is the only *Agrypnus* species occurring in western Europe.

*Adelocera mucorea* LeConte. Holotype. ♂, brick-red paper disk [=Southern States, see p. 277]; *Lacon mucoreus* Lec. [LeC., sic]; *murinus* (MCZ, Harvard).

The published locality is GEORGIA. The contents of the abdomen have been eaten by *Anthrenus*; the sex of the specimen has been determined from the appearance of the last abdominal sternite (see p. 117). Why LeConte labelled the specimen *Lacon mucoreus* when he described it as an *Adelocera* species is unknown. As there is no detailed record of where the specimen was found, there is no means of telling whether this specimen was imported by chance or whether the brick-red paper disk was affixed to a European specimen in error. There are no subsequent records of this species being found in the United States.

*Lacon sordidus* Candèze. LECTOTYPE (present designation). SENEGAL: ♂, Collection Chevrolat; *E. sordidus* Cand. type [?Cand.]; *sordidus* Cand. type Mon. [Fleut.]. The specimen stands over a Chevrolat collection label; *Lacon sordidus* Cand. type Mon. 1, p. 114 : 22, Senegal, Collection Chevrolat (MNHN, Paris).

The origin of this specimen is also unknown. There are no subsequent records of this species from Senegal.

GERMAR'S INTERPRETATION OF *Elater murinus* LINNAEUS. The BMNH possesses six specimens of this species from the Schaum collection. One bears a label 'murinus omn.' in a handwriting I believe to be that of Germar. All the specimens are correctly determined.

*Agrypnus murrayensis* (Blackburn) comb. n.

*Lacon murrayensis* Blackburn, 1891a : 504.

*Lacon murrayensis* Blackburn; Neboiss, 1956 : 10.

The description was based on an unrecorded number of specimens from S. AUSTRALIA, near Murray Bridge.

The BMNH does not possess any specimens of this species. Neboiss (1956 : 10) records that the type is in the SAM, Adelaide, but this cannot be accepted as a valid holotype designation.

The generic attribution is based on the description.

***Agrypnus muscerda* (Candèze) comb. n.**

*Lacon muscerda* Candèze, 1874 : 57.

*Adelocera muscerda* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Cap de Bonne—Espérance. (Coll. Cand.) [SOUTH AFRICA].

Type-material: ? IRSNB, Brussels.

The generic attribution is based on the following specimens, which may be syntypes acquired by Janson. SOUTH AFRICA: 1 ex., Janson coll. ex Candèze, 1903.130; Janson coll. 1903.130; *L. muscerda* Cdz. type [Cand.]. The abdomen is missing. 1 ♀, P.B.S. [Promontorium Bonae Spei]; Janson coll. 1903.130; *muscerda* Cdz. [Cand.]; *Lacon muscerda* Cand. [Gahan]. 1 ♀, P.B.S.; Janson coll. 1903.130; *Lacon muscerda* [Gahan] (BMNH).

The wings and metasternum are much reduced in length.

***Agrypnus muscosus* (Candèze) comb. n.**

*Lacon muscosus* Candèze, 1893c : 170.

*Adelocera muscosus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Kanara and Belgaum in the Andrewes collection (see p. 270).

Syntypes examined. INDIA: 1 ♂, Belgaum P.; Andrewes Bequest B.M. 1922.221; *Lacon muscosus* Cand. [Andrewes]. 1 ♀, Belgaum S.; Andrewes Bequest B.M. 1922.221, 1 ♀, Canara; Andrewes Bequest B.M. 1922.221. 1 ♂, Kanara; Andrewes Coll. B.M. 1933.109. 1 ♂, Kanara; co-type; B.M. 1946.93 [from Bishop coll.] *Lacon muscosus* (BMNH).

The designation of a lectotype is postponed until any material extant in the Candèze collection in the IRSNB, Brussels has been examined.

***Agrypnus musculus* (Candèze) comb. n.**

*Lacon musculus* Candèze, 1857 : 141.

*Colaulon (Cryptolacon) musculus* (Candèze) Chujo, 1959 : 4.

The description is based upon an unrecorded number of specimens from CHINA submitted by Dohrn.

Type-material: ?IPZAN, Warsaw (Dohrn coll.).

The generic attribution is based on the following specimen: ♂, China; Janson coll. ex Candèze, 1903.130; *Lacon musculus* Cdz. China [Cand.]; *Lacon musculus* Cand., ex. coll. Candèze [Gahan] (BMNH). This specimen may be part of the syntype-series retained by Candèze.

***Agrypnus mustellinus* (Germar) comb. n.**

*Lacon mustellinus* Germar, 1840 : 264.

*Lacon birmanicus* Candèze, 1874 : 71. **Syn. n.**

*Adelocera mustellinus* (Candèze) Fleutiaux, 1926 : 96.

Candèze (1857 : 110) records that he received the 'exemplaire typique de Germar' of this species from Schaum. The BMNH manuscript catalogue of the Schaum collection does not list this species. However the MNHU, Berlin contains a single specimen from the Schaum collection (see below). Why this specimen is in Berlin while the type-material of species described at the same time (*tubidus* Germar and *terrenus* Germar) are now in the BMNH collection is unknown. There are no specimens determined as *mustellinus* by Germar in the DEI, Eberswalde.

*Lacon mustellinus* Germar. LECTOTYPE (present designation). ♂, 43275 [Museum catalogue number = Siam, ex Schaum coll.]; *L. mustellinus* Germ. [Candèze] (NMHU, Berlin). The specimen stands beside a yellow label in Gerstaecker's handwriting: *mustellinus* Germ. sec ejus type, Tenasserim Helf. The published locality is SIAM. The locality Tenasserim refers to a second specimen of the same species bearing the number 16113. The absence of Germar's determination label is probably due to Gerstaecker.

The lectotype agrees well with the description except that the antennae are 11-segmented and not 12-segmented as stated by Germar. The last antennal segment is a constricted at the apical third and this may have misled Germar, whose eyesight was not very good (see p. 275), into believing that the antennae were 12-segmented.

*Lacon birmanicus* Candèze. LECTOTYPE (present designation). BURMA: ♂, India, Rangoon; Janson coll. 1903.130; *birmanicus* Cdz. [Cand.]; *Lacon birmanicus* Cand. type [Arrow] (BMNH).

Paralectotypes. 2 ♂, India, Rangoon; Janson coll. 1903.130 (BMNH).

***Agrypnus muticus* (Herbst) comb. n.**

*Elater muticus* Herbst, 1806 : 93; pl. 166, fig. 10.

*Lacon muticus* (Herbst) Germar, 1840 : 262.

*Adelocera muticus* (Herbst) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). ♂, Nr. 16126 (museum catalogue number = data on next label): India or. Mus. Hbst.; (NMHU, Berlin).

Paralectotypes. 1 ♂, data as lectotype. 1 ♀, Hbst.; 16126; India or. Mus. Hbst. Nr. 16126. 1 ♀, Siam, Kaden; India or. Mus. Hbst. Nr. 16126. 1 ♀, Bintang

Rottgor; India or. Mus. Hbst. Nr. 16126. 2 ♀, India or. Mus. Hbst. Nr. 16126 (MNHU, Berlin).

The specimens stand beside a yellow label in Gerstaecker's handwriting: *muticus* Cand., + *Elater muticus* Hbst. + Ind. or. The absence of Herbst's determination label is probably due to Gerstaecker (see p. 275). The published locality is 'Ost Indien'.

GERMAR'S INTERPRETATION OF *Elater muticus* HERBST. Germar refers to Herbst, 1806 : 93; tab. 166, fig. 10 but as he records that the specimens before him probably came from Arabia (corrected, loc. cit. p. 440, to Siam) it can be assumed that he had before him material determined from the description. For the history of the Germar collection see p. 275. Neither the DEI, Eberswalde, or NMHU, Berlin contain this material. Candèze (1857 : 154) states that he received Germar's specimens from Schaum. The BMNH manuscript catalogue of the Schaum collection lists two specimens of *muticus* Helf. [sic] from Arabia. The BMNH collection contains two female specimens without localities from the Schaum collection. One bears a label: *L. muticus* Hbst. collect. Germ. in Candèze's handwriting. I believe that these specimens, which are correctly identified, are those on which Germar based his interpretation of *muticus* Herbst.

***Agrypnus myamoti* (Nakane & Kishii) comb. n.**

*Cryptolacon myamoti* Nakane & Kishii, 1955 : 1; pl. 1, fig. 1.

*Colaulon (Cryptolacon) myamoti* (Nakane & Kishii) Kishii, 1961 : 25.

Holotype. JAPAN: ♂, Takarajima 29.V.1953, T. Nakane leg. Allotype: ♀, Takarajima, 31.V.1953, T. Nakane leg.

Paratypes: 41 ex, Takarajima, 26-30.V.1953. 9 ex, Nakanoshima, 4-13.VI.1953, S. Miyamoto, T. Nakane & S. Uéno leg. The type-material is in the Osaka Municipal Museum of Natural History, the Entomological Laboratory of the Kyushu University and in the Nakane and Kishii collections.

***Agrypnus mysticus* (Candèze) comb. n.**

*Lacon mysticus* Candèze, 1857 : 104.

*Adelocera mysticus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. MADAGASCAR: ♀, Laf. Madagascar; Madagascar; Janson coll. 1903.130; *L. mysticus* type [Cand.]; *Lacon mysticus* Cdze. Cand. Type e coll. de Laferté [Janson]; 38 bis (BMNH).

***Agrypnus nagaoi* (Ohira) comb. n., sp. rev.**

*Colaulon (Sagojyo) nagaoi* Ohira, 1966 : 7.

The description is based on a holotype and nine paratypes from the RYUKYU ISLANDS, Japan. The location of the material is not recorded. It is probably

in the author's collection or one of the collections recorded by Ohira (1966 : 7, footnote).

The generic attribution is based on the description.

Ohira (1971c : 66) synonymizes this species with *lupinosus* (Candèze) (p. 178) but as the figure of the aedeagus of *nagaoi* (Ohira, 1971c : 65, fig. 2) shows it to be very different from that of *lupinosus* the synonymy cannot be accepted.

***Agrypnus ngokoensis* comb. n.**

*Lobotarsus crenatus* Schwarz, 1902a : 313.

*Agrypnus crenatus* (Schwarz) **comb. n.** [Secondary junior homonym of *Agrypnus crenatus* (Klug, 1833).]

LECTOTYPE (present designation). CAMEROUN: ♀, Cameroun, Vallée de la N'Goko, Janvier 1900, Jobit; *Lobotarsus crenatus* Schw. [Schwarz] (MNHN, Paris).

The description is based on an unrecorded number of specimens received from Fleutiaux. There are no specimens from the Schwarz collection in the DEI, Eberswalde.

***Agrypnus niger* (Schwarz) comb. n.**

*Lacon niger* Schwarz, 1905 : 258.

*Adelocera niger* (Schwarz) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: ♂, Darjeeling; Coll. Schwarz; Typus (DEI, Eberswalde).

Paralectotypes: 1 ♀, Darjeeling; coll. Schwarz; Typus. 2 ♀, same labels, and also *niger* Schw. [Schwarz] (DEI, Eberswalde).

***Agrypnus nigrinus* (Candèze) comb. n.**

*Lacon nigrinus* Candèze, 1857 : 137; pl. 2, fig. 7.

*Adelocera nigrinus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). SOUTH AFRICA: Deyr. P.B.S. [Promontorium Bonae Spei]; 308; Janson coll. 1903.130; *L. nigrinus* Cdz. type [Cand.]; *Lacon nigrinus* Cdze. type e coll. Deyrolle [Janson] (BMNH).

The metasternum and wings are much reduced in length.

***Agrypnus nivalis* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *nivalis* Fleutiaux, 1934b : 54.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Perinet, Forêt côte est; *nivalis* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes. 1 ♀, 2 ex., same locality labels as lectotype but without

determination labels 1 ex., Museum Paris, Madagascar, Mahatsinjo, Coll. J. Chatanay 1914; *nivalis* Fleut. [Fleut.] (MNHN, Paris).

***Agrypnus nodicollis* (Candèze) comb. n.**

*Lacon nodicollis* Candèze, 1857 : 101.

*Adelocera nodicollis* (Candèze) Fleutiaux, 1926 : 96.

Holotype. MADAGASCAR: Madagascar; Janson coll. 1903.130; *Lacon nodicollis* Cdze, type (e coll. de Mniszech) [Janson] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276).

The female from Madagascar, Diego Suarez, Alluaud, 1893 (Candèze, 1895 : 54, locality) determined by Candèze in the IRSNB, Brussels is not conspecific with the holotype. It belongs to a species unknown to me.

***Agrypnus nodieri* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *nodieri* Fleutiaux, 1934b : 49.

LECTOTYPE (present designation). MADAGASCAR: ♀, Diego Suarez, Madag.; Coll. Nodier; *Adelocera nodieri* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype. ♂, Museum Paris, Madagascar, Reg. de Sakarami, Maurice de Rothschild, 1905; *nodieri* Fleut. [Fleut.] (MNHN, Paris).

***Agrypnus nodifer* (Klug) comb. n.**

*Elater* (*Agrypnus*) *nodifer* Klug, 1833 : 62; pl. 3, fig. 2 (1834 : 152).

*Lacon nodifer* (Klug) Germar, 1840 : 264.

*Adelocera nodifer* (Klug) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♀, 16092 [museum catalogue number = data on the following label]; Madagascar Goud. (NMHU, Berlin). The specimen stands beside a blue Gerstaecker label: *nodifer* Cand. *Elater nodifer* Klug, Madag. Goudot. The absence of Klug's determination label is probably due to Gerstaecker (see p. 275).

GERMAR'S INTERPRETATION OF *Elater nodifer* KLUG. Germar does not give a description of *nodifer* Klug. As neither the DEI, Eberswalde, NMHU, Berlin nor BMNH collections contain any material bearing Germar's determination label, I have assumed that Germar based his interpretation of the species on Klug's description or specimens.

***Agrypnus nubilus* (Candèze) comb. n.**

*Tilotarsus* [sic] *nubilus* Candèze, 1857 : 175.

*Lobotarsus nubilus* (Candèze) Schwarz, 1906 : 30.

LECTOTYPE (present designation). GABON: ♀, Gaboon; Janson coll. 1903.130;

*Tilotarsus nubilus* Cdz. Gaboon Deyr. [Cand.]; *Tylotarsus nubilus* Cdze., ex coll. Candèze [Janson] (BMNH).

I have not found any specimens from Guinea and Benguela, the other two localities recorded by Candèze.

***Agrypnus oberndorferi* (Schwarz) comb. n.**

*Lacon oberndorferi* Schwarz, 1902b : 197.

*Adelocera oberndorferi* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on a holotype from MADRAS, Dindigul submitted by Obernderfer. This specimen cannot be found in the Schwarz collection in the DEI, Eberswalde.

The generic attribution is based on the following specimen; BURMA: ♀, Rangoon; coll. Schwarz; oberndorferi Schw. [Schwarz] (DEI, Eberswalde). The specimen is 7 mm long compared with the published length of 9 mm.

***Agrypnus obscurus* (Fleutiaux) comb. n.**

*Adelocera (Archontas) obscura* Fleutiaux, 1934b : 51.

LECTOTYPE (present designation). MADAGASCAR: ♀, Madagascar, Lamberton, obscura Fleut., type [Fleut.] (MNHN, Paris).

The published locality is Madagascar (Lamberton).

***Agrypnus octavus* (Candèze) comb. n.**

*Lacon octavus* Candèze, 1874 : 95.

*Adelocera (Compsolacon) octava* (Candèze) Van Zwaluwenburg, 1959 : 354.

Lectotype (designated by Van Zwaluwenburg, 1959 : 354, see p. 9). AUSTRALIA: ♀, N. H. Holl. C. Cdze.; Janson coll. ex Candèze, 1903.130; *Lacon octavus* Cdz. n.sp. N. Austr. Th. [Cand.]; *Lacon octavus* Cand. type, Queensland [Gahan] (BMNH).

Candèze comments that in shape this species resembles *Myrmodes* [*akidiformis* Candèze]. In both species the metathorax is much reduced in length and the wings no more than minute flaps. The main difference is that in the *Myrmodes* species the humera are less strongly angled.

***Agrypnus orientalis* Hope**

*Agrypnus orientalis* Hope, 1843 : 63.

Both Candèze (1891) and the Schenkling Catalogue (1925) record the date of publication of *orientalis* as 1845. However a shorter form of Hope's 1845 paper appeared (see Wheeler, 1912) in the Proceedings of the Entomological Society

for March 7th, 1842, which were published in the *Annals and Magazine of Natural History* in January, 1843.

LECTOTYPE (present designation). ?WEST MALAISIA: ♀, Penang/Dr Cantor; *orientalis* Hope (BMNH). The specimen lacks a registration label but the locality and identification labels are identical to those found on specimens in the BMNH, known to come from the East-India Company's museum. The locality is probably erroneous (see notes on the Cantor collection, p. 272).

Candèze (1891 : 22) tentatively places this species in synonymy with *bipapulatus* Candèze, 1865. Confirmation of the synonymy is postponed until more material becomes available and the species can be studied in greater detail.

***Agrypnus ornatellus* (Candèze) comb. n.**

*Lacon ornatellus* Candèze, 1889 : 72 (6).

*Adelocera ornatellus* (Candèze) Fleutiaux, 1926 : 99.

The description is based on an unrecorded number of specimens from MADAGASCAR.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♀, Madagascar Goudot, 1834; *ornatellus* Cand. [Cand.] (MNHN, Paris).

***Agrypnus ornatus* (Candèze)**

*Lacon ornatus* Candèze, 1857 : 102.

*Agrypnus ornatus* (Candèze) Ohira, 1971 : 226.

The description is based on an unrecorded number of specimens from JAVA in the Mniszech collection.

Type-material: ?IRSNB, Brussels (see p. 273).

The generic attribution is based on the following specimen: JAVA; *Lacon ornatus* Cdz., Java [Cand.]; *Lacon ornatus* Cand. ex coll. Cand. [Gahan] (BMNH).

***Agrypnus oshimanus* Ohira**

*Agrypnus* (*Agrypnus*) *oshimanus* Ohira, 1969a : 91; fig. 1, pl. 1, fig. 13.

Holotype. JAPAN: ♂, Amami-Oshima (Hatsuno), 3.IV.1964 (*T. Akashi*) (Ohira collection).

Paratype. ♀, same data as the holotype (Ohira collection).

***Agrypnus paenulatus* (Boheman) comb. n.**

*Lacon paenulatus* Boheman, 1851 : 415.

*Adelocera paenulatus* (Boheman) Fleutiaux, 1926 : 96.

*Archontoides pretoriensis* Cobos, 1966 : 651. **Syn. n.**

*Lacon paenulatus* Boheman. LECTOTYPE (present designation). SOUTH AFRICA: ♂, Caffraria; J. Wahlb. (NR, Stockholm).

Paralectotypes. 1 ex (? ♂, abdomen missing), 1 ♀, same labels as lectotype. 1 ex. (? ♀, abdomen missing). Caffraria; J. Wahlb.; *paenulatus* Boh. [Boh.] (NR, Stockholm).

The published locality is 'Habitat in terra Natalensi'. The localities of Boheman's material are discussed on p. 280. The male was selected as the lectotype because the specimen bearing Boheman's determination label lacks the abdomen.

*Archontoides pretoriensis* Cobos. Holotype. SOUTH AFRICA: ♀, Fountains, Pretoria, Africa det. Sur (Al. Capner coll. 3.1.1951 leg); *Archontoides pretoriensis*; *Archontoides pretoriensis mihi* [Cobos] (Cobos collection).

### ***Agrypnus paleatus* (Champion) comb. n.**

*Lacon paleatus* Champion, 1894 : 267.

*Pyrganus paleatus* (Champion) Golbach, 1968 : 198.

Syntypes examined. PANAMA: 2 ♂, 4 ♀, V. de Chiriqui, 25-4000 ft. Champion; BCA Coll. III(1) *Lacon paleatus* Ch. [Champion] (BMNH). Two males are marked '♀' by Champion (see p. 117) and one female bears a label: 'sp. figured'. Lectotype designation is postponed until the specimens have been studied in greater detail.

It is of interest to note that in all the syntypes the margins of the prothorax are crenate to a greater or lesser degree (cf. Golbach's generic diagnosis of *Pyrganus*).

### ***Agrypnus palliatus* (Candèze) comb. n.**

*Lacon palliatus* Candèze, 1893b : 7.

*Adelocera palliatus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR, Andrangoloaca.

Type-material: ?IRSNB, Brussels.

The generic attribution based on Candèze's comment 'Jolie espèce du groupe du *turbidus*' (= *Agrypnus turbidus* (Germar), see p. 224).

### ***Agrypnus palliditarsis* (Candèze) comb. n.**

*Lacon palliditarsis* Candèze, 1857 : 120; pl. 1, fig. 18.

*Adelocera palliditarsis* (Candèze) Fleutiaux, 1926 : 99.

LECTOTYPE (present designation). SOUTH AFRICA: ♀, Type; 106; L. palliditarsus [Cand.]; *Adelocera palliditarsis* Chevr. Schaum [unknown mss., last few words illegible]; Collection Chevrolat; n.sp. Germ. palliditarsus Cand. type Mon. [Fleut.] (MNHN, Paris). The specimen stands beside a Chevrolat collection label: *Lacon palliditarsis* Cand., type Mon. 1 : 120, 33 Cap. bon. sp. Chevrolat.

***Agrypnus pallidus* (Candèze) comb. n.**

*Lacon pallidus* Candèze, 1887 : 190.

*Adelocera pallidus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. SUMATRA: ♀, Dr B. Hagen, Tandjong Morawa, Serdang (N. O. Sumatra) *L. pallidus* Cdz. n.sp. [Cand.] (RNH, Leyden).

***Agrypnus palpalis* (Candèze) comb. n.**

*Lacon palpalis* Candèze, 1882 : 13.

*Adelocera (Compsolacon) palpalis* (Candèze); Van Zwaluwenburg, 1959 : 354.

Lectotype (designated by Van Zwaluwenburg, 1959 : 354). AUSTRALIA: sex undetermined, Northern Australia, from the Monchicourt collection (IRSNB, Brussels). Not examined.

Van Zwaluwenburg does not record whether the specimen bears a locality or determination label.

The published locality is 'Australia Septentrionale: Cleveland Bay' [near Townsville, Queensland]. The fact that Candèze records that he found the material in the 'ancienne collection Monchicourt' suggests that the material was in his own collection. Candèze acquired the Monchicourt collection via E. Deyrolle (Horn & Kahle, 1936 : 181). Whether the two additional specimens recorded by Van Zwaluwenburg formed part of the original syntype series is unknown.

***Agrypnus pantherinus* (Fleutiaux) comb. n.**

*Centrostethus pantherinus* Fleutiaux, 1934b : 60.

LECTOTYPE (present designation). MADAGASCAR: ♀, Madagascar, Perinet, Forêt côte est.; *pantherinus* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotype. 1 ex., same locality as the lectotype, without determination labels (MNHN, Paris).

I have not seen specimens from the other four recorded localities, Fort Tanala (*Ch. Alluaud*), Ifandana (coll. *Ch. Alluaud*). Mahatsinjo, près Beforona (coll. *J. Chatanay*), Province de Mananjary (*Goissaud*). This material should also be in the MNHN, Paris.

***Agrypnus parallellicollis* (Candèze) comb. n.**

*Lacon parallellicollis* Candèze, 1857 : 118.

*Adelocera parallellicollis* (Candèze) Fleutiaux, 1926 : 96.

Holotype. JAVA: ♀, Java, *L. parallellicollis* Cand. [Cand.]; Collection Chevrolat; *parallellicollis* Cand. type [Fleut.]. The specimen stands beside a yellow Chevrolat label: *Lacon parallellicollis* Cand. type Mon. 1, p. 118, 29. Java, Collection Chevrolat (MNHN, Paris).

***Agrypnus parallelus* (Candèze) comb. n.**

*Lacon parallelus* Candèze, 1874 : 90.

*Lacon parallelus* (Candèze); Neboiss, 1956 : 11.

The description is based on an unrecorded number of specimens from Queensland. Neboiss (loc. cit) states that the type is in the BMNH, but the date of publication (see p. 271) suggests that the type-material should be in the IRSNB, Brussels. Selection of a lectotype is postponed until any material in that collection has been examined.

Generic attribution based on the following specimen, possibly a syntype; AUSTRALIA: ♂, N. Holl. C. Cdze.; Janson coll. ex Candèze, 1903.130; *Lacon parallelus* Cdz. n.sp. N. Austr. Th. [Cand.] *Lacon parallelus* Cand. type [Gahan] (BMNH).

***Agrypnus parvus* (Schwarz) comb. n.**

*Tilotarsus* [sic] *parvus* Schwarz, 1903a : 338.

The description is based on an unrecorded number of specimens from MADAGASCAR. Type-material: ?DEI, Eberswalde.

The generic attribution is based on the description.

***Agrypnus parviceps* (Gyllenhal) comb. n.**

*Elater parviceps* Gyllenhal in Schoenherr, 1817 : 133.

*Lacon parviceps* (Schoenherr) Germar, 1840 : 263.

LECTOTYPE (present designation). SIERRA LEONE: ♂, S. Leone, Afzelius (NR, Stockholm). The specimen lacks a determination label but as far as is known the specimen has always stood and been regarded as the type of *parviceps* Gyllenhal. The species is not listed in Schenkling (1925).

GERMAR'S INTERPRETATION OF *Elater parviceps* GYLLENHAL. Germar comments that *Elater parviceps* Schönh. [sic] appears to be related to *Lacon terrenus*. Whether he based his interpretation on the description or on determined specimens is unknown, but examination of the material in the NR, Stockholm has shown that he was justified in his belief. *A. parviceps* (Gyllenhal) differs from *terrenus* Germar (= *crenatus* Klug) in that the fourth tarsal segments are lobed.

***Agrypnus parvus* (Fleutiaux) comb. n.**

*Centrostethus parvus* Fleutiaux, 1934b : 61.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Perinet, Forêt côte est; *parvus* Fleut. type [Fleut.] (MNHN, Paris).

Paratypes. 4 ex, same locality as lectotype, without determination labels (MNHN, Paris).

***Agrypnus pauliani* (Girard) comb. n.**

*Archontas pauliani* Girard, 1970 : 28.

Holotype. MADAGASCAR: ♂, massif du Tsaratanana, Matsabory en dessous de l'Andohanisambirano, 1,900 m [2,050 m], début xii.1964 (*P. Soga*) (MNHN, Paris).

Paratype. 1 ♀, same locality as holotype (Girard collection, Laboratoire de Zoologie, Ecole normale supérieure, Paris).

Both specimens bear Girard's determination label.

***Agrypnus pauper* (Candèze) comb. n.**

*Lacon pauper* Candèze, 1878a : 100.

*Adelocera pauper* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Teibodas JAVA, collected by Beccari.

Type-material: MCSN, Genoa and ?IRSNB, Brussels.

The generic attribution is based on the description.

***Agrypnus perplexus* (Elston) comb. n.**

*Lacon perplexus* Elston, 1924 : 202.

*Lacon perplexus* Elston; Neboiss, 1956 : 11.

The description is based on an unrecorded number of specimens from N.W. AUSTRALIA: Forest River (*W. Crawshaw*), Hammersley Range (*W. D. Dodd*), Wyndham (*W. Crawshaw*), Northern Territory: Port Darwin.

Syntype-material (see p. 274): AM, Sidney, SAM, Adelaide, NM, Victoria.

The generic attribution is based on syntype ♀, Wyndham (*W. Crawshaw*) (SAM, Adelaide).

***Agrypnus pictilis* (Schwarz) comb. n.**

*Lacon pictilis* Schwarz, 1899 : 76.

*Adelocera pictilis* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from D. Ost. Africa [TANZANIA], collected by Bennigsen.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen; KENYA: ♀, Malanga, Br. O. Afr.; *pictilis* Schw. comparé au type [Fleut.] (MNHN, Paris).

***Agrypnus pictipennis* (Candèze) comb. n.**

*Lacon pictipennis* Candèze, 1857 : 150.

*Lacon pictipennis* Candèze; Neboiss, 1956 : 11.

The description is based on an unrecorded number of specimens from Van Diemensland [Tasmania]. Candèze adds that he received the species from la Ferté Sénectère, determined as *Agrypnus pictipennis* Gory. The BMNH does not possess any specimens from Tasmania determined by Candèze. As Candèze (1874 : 93) records the locality as 'Nouvelle Galles du sud et Victoria' and as 'Austr. merid.' in the catalogue (1891 : 25) it is possible that the originally published locality is erroneous.

**LECTOTYPE** (present designation). AUSTRALIA: ♀, Laf. Tasmania [Janson]; *pictipennis* Gory, Nov. Holl. [? Laferté Sénectère]; *Lacon pictipennis* Cdze Cand. Type e coll. de Laferté [Janson]; Janson coll. 1903.130 (BMNH). The locality label 'Tasmania' was obviously added by Janson following Candèze's original publication. The absence of Candèze's determination label is almost certainly due to Janson.

***Agrypnus pictiventris* (Candèze) comb. n.**

*Lacon pictiventris* Candèze, 1857 : 127; pl. 2, fig. 8.

*Adelocera pictiventris* (Candèze) Fleutiaux, 1926 : 96.

Holotype. MADAGASCAR: ♂, Laf. Madagascar; *pictiventris* [Cand.]; Coquerel; *Lacon pictiventris* Cdze, Cand. Type e coll. de Laferte [Janson]; Janson coll. 1903.130 (BMNH).

***Agrypnus piger* (Candèze) comb. n.**

*Lacon piger* Candèze, 1889 : 73 (7).

*Adelocera piger* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number ['plusieurs'] of specimens collected at Tetara, BENGAL by Renard.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen, possibly a syntype: ♀, Tetara; *L. piger* nov. spec. fascicule IV, p. 7 [Cand.] (MNHN, Paris).

***Agrypnus pinguis* (Candèze) comb. n.**

*Lacon pinguis* Candèze, 1893b : 9.

*Lacon pinguis* Candèze; Neboiss, 1956 : 11.

The description is based on an unrecorded number of specimens from AUSTRALIA, Cooktown [Queensland].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen; AUSTRALIA: ♀, Austr.; *pinguis* Cand. det. Cand. teste Fleut. [Fleut.] (MNHN, Paris).

***Agrypnus pipitzi* (Candèze) comb. n.**

*Lacon pipitzi* Candèze, 1889 : 72 (6).

*Adelocera pipitzi* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded ('plusieurs') number of specimens received from Pipitz.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: MADAGASCAR: ♂, Madagascar: pipitzi Cand. [Fleut.] (MNHN, Paris).

***Agrypnus pistorius* (Candèze) comb. n.**

*Lacon pistorius* Candèze, 1893c : 171.

*Adelocera pistorius* (Candèze) Fleutiaux, 1926 : 96.

Syntypes examined. INDIA: 2 ♂, 2 ♀, Kanara; cotype (BMNH curatorial label). One specimen bears Andrewes' determination label, and another a determination label in an unknown hand (BMNH). The description was based on six specimens. The selection of a lectotype is postponed until a search has been made for the remaining two specimens.

***Agrypnus plagiatus* (Candèze) comb. n.**

*Lacon plagiatus* Candèze, 1878b : LIV (8).

*Lacon plagiatus* Candèze; Neboiss, 1956 : 11.

The description is based on an unrecorded number of specimens from Australia, Port Denison [near Bowen, QUEENSLAND].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♀, *Lacon plagiatus* Cand. Cooktown [?Cand.] (MNHN, Paris).

***Agrypnus planatus* (Candèze) comb. n.**

*Lacon planatus* Candèze, 1895b : 55.

*Adelocera planatus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR, Imerina (*Sikora*).

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: MADAGASCAR: ♂, Madag., Collection Fleutiaux; *L. planatus* Cand. n.sp. El. n. vi [?Cand.], *L. planatus* Cand. Ann. Belg. 95 : 55. Cand. det. [Fleut.] (MNHN, Paris).

The description did not appear in *Elaterides Nouveaux* 6, 1896.

***Agrypnus pleureticus* (Candèze) comb. n.**

*Lacon pleureticus* Candèze, 1874 : 93.

*Lacon pleureticus* Candèze; Neboiss, 1956 : 11.

The description is based on an unrecorded number of specimens from Queensland, Rockhampton and Brisbane in the Candèze and Janson collections.

Syntypes examined. AUSTRALIA: 1 ♂, N. Holl./C. Cdze; *Lacon pleureticus* Cdz. n.sp. N. Austr. Th. [Cand.]; *Lacon pleureticus* Cdz. ex coll. Cand. [Janson] type [Gahan]. 1 ♂, same locality and collection, but without determination labels (BMNH). The selection of a lectotype is postponed until any material from the Candèze collection extant in the IRSNB, Brussels has been examined.

***Agrypnus porcinus* (Candèze) comb. n.**

*Lacon porcinus* Candèze, 1857 : 143.

*Adelocera porcinus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. REUNION: ♂, Laf. Insula Bourbon; Janson coll. 1903.130; *Lacon porcinus* Cdz. Cand. type e coll. de Laferté [Janson]; *porcinus* Cdz. type [Cand.] (BMNH).

***Agrypnus porosus* (Klug) comb. n.**

*Elater (Agrypnus) porosus* Klug, 1835 : 65 (1834 : 153).

*Adelocera porosus* (Klug) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♂, 16099 [museum catalogue number refers to data on following label]; Madag. Goud.; *porosus* Cand. *Elater porosus* Klug Madag. Goud. [Gerstaecker] (NMHU, Berlin).

Paralectotype. ♂, Madagasc. Goud. Nr. 16099 (NMHU, Berlin).

***Agrypnus porrectus* (Fleutiaux) comb. n.**

*Adelocera (Archontas) porrecta* Fleutiaux, 1934b : 58.

LECTOTYPE (present designation). MADAGASCAR: ♂, Fianarantsoa Madagascar; *porrecta* Fleut. type [Fleut.] (MNHN, Paris).

***Agrypnus porriginosus* (Candèze) comb. n.**

*Lacon porriginosus* Candèze, 1874 : 93.

*Lacon porriginosus* Candèze; Neboiss, 1956 : 11.

LECTOTYPE (present designation). AUSTRALIA: ♀, W. Australia; Nikol Bay; Janson coll. 1903.130; *L. porriginosus* Cdz. [Cand.]; *Lacon porriginosus* Cand. type, Nikol Bay [Gahan] (BMNH).

***Agrypnus praelongus* (Elston) comb. n.**

*Lacon praelongus* Elston, 1927 : 355.

*Lacon praelongus* Elston; Neboiss, 1956 : 11.

The description is based on an unrecorded number of specimens from Cunnamulla [Queensland] (*H. Hardcastle*).

Syntype material (see p. 274). SAM, Adelaide, AM, Sydney.

The generic attribution is based on the following specimen: AUSTRALIA: Queensland, Dr K. K. Spence; determined by Carter, teste Fleutiaux [Fleut.] (MNHN, Paris).

***Agrypnus praetermissus* (Candèze) comb. n.**

*Lacon praetermissus* Candèze, 1874 : 76.

*Adelocera praetermissus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). INDIA: ♂, India [Janson]; Janson coll. 1903.130; *Lacon praetermissus* Cand. type India [Gahan]; sp. nov. ac distinctissima nec serrula sec typ. et descript. *L. praetermissus* mihi [Janson]; *Lacon serrula* Cdz. [Cand.]; *Lacon serrula* [crossed out] Cdze Cand. e coll. D. Parry [Janson] (BMNH).

The description is based on an unrecorded number of specimens from 'Indes orientales (Coll. Janson)'. The absence of Candèze's determination label and the discrepancy between the published locality and the label are probably due to Janson (see p. 276).

***Agrypnus praetexta* (Fleutiaux) comb. n.**

*Adelocera (Archontas) praetexta* Fleutiaux, 1934b : 57.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Perinet, Forêt côte est.; Type; *praetexta* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus princeps* (Fleutiaux) comb. n.**

*Lacon princeps* Candèze, 1874 : 89.

*Adelocera (Compsolacon) princeps* (Candèze); Van Zwaluwenburg, 1959 : 354.

Lectotype (designated by Van Zwaluwenburg, 1959 : 354). ♀, AUSTRALIA: Cape York; Janson coll. 1903.130; *L. princeps* Cdz. type [Cand.]; *Lacon princeps* Cand., type, Cape York [Gahan] (BMNH).

***Agrypnus procellosus* (Candèze) comb. n.**

*Lacon procellosus* Candèze, 1895b : 54.

*Adelocera procellosus* (Candèze) Fleutiaux, 1926 : 99.

The description is based on an unrecorded number of specimens from MADAGASCAR, Imérina (*Sikora*).

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♀, Madag.; *L. procellosus* Cand. El.n.vi [?Cand.]; *L. procellosus* Cand. Ann. Belge 1895 p. 54 Cand. det. [Fleut.] (MNHN, Paris).

***Agrypnus proxima* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *proxima* Fleutiaux, 1934b : 54.

LECTOTYPE (present designation). MADAGASCAR: ♂, Diego Suarez; *proxima* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotype: 1 ♂, Diego Suarez; *proxima* Fleut. [Fleut.] (MNHN, Paris).

***Agrypnus pulvereus* (Candèze) comb. n.**

*Tilotarsus* [sic] *pulvereus* Candèze, 1889 : 74 (8).

LECTOTYPE (present designation). MADAGASCAR: ♀, Museum Paris, Madagascar, Boivin 12.53; 12.53, Madagascar, M. Boivin; *Tilotarsus pulvereus* Cand. sp.n. 89 [Cand.]; *mucoreus* [Fleut.] (MNHN, Paris).

Fleutiaux (1899 : 223) states that this is an immature *mucoreus* Candèze, but comparison of the lectotypes has shown that this is not the case.

***Agrypnus punctatissimus* (Elston) comb. n.**

*Lacon punctatissimus* Elston, 1927 : 362.

*Lacon punctatissimus* Elston; Neboiss, 1956 : 12.

The description is based on an unrecorded number of specimens from AUSTRALIA; N. Territory, Groote Eylandt (*N. B. Tyndale*).

Syntypes (see p. 274). SAM, Adelaide, AM, Sydney.

The generic attribution based on the following syntype; AUSTRALIA: ♀, Groote Eylandt, N. Territory (*N. B. Tyndale*) (SAM, Adelaide).

***Agrypnus punctipennis* (Candèze) comb. n.**

*Lacon punctipennis* Candèze, 1874 : 99.

*Lacon punctipennis* Candèze; Neboiss, 1956 : 12.

LECTOTYPE (present designation). AUSTRALIA: ♂, West Austral.; Janson coll. 1903.130; *punctipennis* Cdz. type [Cand.]; *Lacon punctipennis* Cand. type W. Australia [Janson] (BMNH).

Paralectotype. 1 ♀, West Australia/Nikol Bay; Janson coll. 1903.130; *Lacon punctipennis* Cand. cotype [Gahan] (BMNH).

The description is based on an unrecorded number of specimens from 'Australie occidentale (Coll. Janson)'. The wings and metasternum are much reduced in length.

***Agrypnus pupillus* (Candèze) comb. n.**

*Lacon pupillus* Candèze, 1892b : 802.

*Adelocera* (*Compsolacon*) *pupilla* (Candèze); Van Zwaluwenburg, 1959 : 354.

Lectotype (designated by Van Zwaluwenburg, 1959 : 354). NEW GUINEA: ♀, Dilo, New Guinea (Loria) (MCSN, Genoa). Van Zwaluwenburg does not record whether the specimen bears Candèze's determination label.

Paralectotypes. Van Zwaluwenburg states that the lectotype is the first of seven specimens, but does not record the data on the remaining six. Whether they are paralectotypes can be determined only by inspection of the locality labels. 7 ex, N. Guinea, Dilo, Loria VI-VII.90; Coll. R. Oberthur, 1952; 2 specimens are labelled: *Lacon pupillus* n.sp. Cand. [?Cand.]. 5 ex, same locality, one specimen with a similar determination label. 1 ex, N. Guinea Ighibirei, Loria vii.viii.90; *L. pupillus* Cand. n.sp. [?Cand.]; Cand. Ann. Mus. Civ. Gen. 1892 p. 80 [Fleut.] (MNHN, Paris). The specimens recorded from Hula, etc., by Candèze have not been located.

***Agrypnus quadricollis* (Fairmaire) comb. n.**

*Lacon quadricollis* Fairmaire, 1903 : 202.

*Adelocera quadricollis* (Fairmaire) Fleutiaux, 1926 : 99.

Syntypes examined. MADAGASCAR: 1 ex, Madag. Perrier; Museum Paris, Madagascar, Perrier de la Bathie 1906; *Lacon* [Fleut] *quadricollis* Fairm. [Fairm] Fleutiaux det., 4 ex, same locality and collection without determination labels. 1 ex, ibidem; *quadricollis* Fairm, ex typ. [Fleut.] (MNHN, Paris).

The metasternum and wings are much reduced in length.

***Agrypnus quadrinotatus* (Schwarz) comb. n.**

*Lacon quadrinotatus* Schwarz, 1908a : 73.

*Lacon quadrinotulus* Schenkling, 1925 : 32. [Unnecessary replacement name, see Schenkling, 1927 : 517.]

*Adelocera quadrinotatus* (Schwarz) Fleutiaux, 1926 : 99.

The description is based on an unrecorded number of specimens from Madagascar.

Type-material: ? DEI, Eberswalde.

The generic attribution is based on the following specimen: MADAGASCAR, ♂, Nossi bé, Loucoube, Ch. Alluaud, 1897; *Lacon quadrinotatus* Schwarz, comparé au type [Fleut] (MNHN, Paris).

***Agrypnus quedenfeldti* nom. n.**

*Tylotarsus fuscus* Quedenfeldt, 1886 : 25.

*Agrypnus fuscus* (Quedenfeldt) **comb. n.** [Junior secondary homonym of *Agrypnus fuscus* (Fabricius 1801).]

LECTOTYPE (present designation). ♂, *Tylotarsus fuscus* Qdf. Qgo. [Qued]; Ex Museum Quedenfeldt (MNHN, Paris).

The published localities are ANGOLA and Quango R. [Kwango or Cuango] Coll. Mechow. The exact locality is unknown.

***Agrypnus rectangularis* (Say) comb. n.**

*Elatér rectangularis* Say, 1825 : 263.

*Colaulon rectangularis* (Say) Arnett, 1952 : 118.

The description is based on an unrecorded number of specimens 'I found near the Rocky Mountains during the journey of Major Long's exploring party'. From the account of this exploring party (James, 1823) the type-locality is probably eastern Colorado, between 20°20'N. and 40°40'N. and 104°W. and 105°W. As Say almost certainly retained the material he collected, it has presumably been lost together with the rest of his collection (see p. 279). Miss P. Schuyler reports that it cannot be found in the ANS, Philadelphia. Long's material has not been located (see p. 278).

The generic attribution is based on material standing over this name in the BMNH and MNHN, Paris. The BMNH series includes specimens with wings of normal length and others in which the wings are much reduced. Examination of series of specimens may show that a reduction in wing length, unaccompanied by a reduction in the length of the metathorax is an intraspecifically variable characteristic. However, until a neotype is designated, the identity of *rectangularis* Say remains unknown.

For *Adelocera curtus* Le Conte which Arnett (1952 : 118) and Golbach (1968 : 198) regard as a synonym of *rectangularis* see p. 146.

***Agrypnus recticollis* (Elston) comb. n.**

*Lacon recticollis* Elston, 1930 : 4.

The description is based on an unrecorded number of specimens from AUSTRALIA; Queensland, Malanda (Dr E. Mjöberg). Elston states that the type is in the NR, Stockholm, but unless that museum received only one specimen, this statement cannot be accepted as a valid type-designation. Neboiss (1956 : 12) records the presence of paratypes in the AM, Sidney.

The generic attribution is based on the description and Elston's statement that the species resembles *vandepolli* Candèze (= *Agrypnus vandepolli*, see p. 227).

At first sight *Lacon recticollis* Elston appears to be a junior primary homonym of *Lacon recticollis* Fleutiaux, 1927. However, the two species are not congeneric as

Fleutiaux's interpretation of *Lacon* is that of Castelnau, 1836 (and the present work, type-species *punctatus* Herbst) while Elston, apparently unaware of Fleutiaux's (1926) correction of the Schenkling catalogue, continued to use Germar's (1840) interpretation of *Lacon* (type-species *murinus* Linnaeus = *Agrypnus* Eschscholtz of the present work).

***Agrypnus reductus* (Candèze) comb. n.**

*Lacon reductus* Candèze, 1878b : LIV (8).

*Adelocera reductus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from SUMATRA.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on Candèze's observation that the species bears a close resemblance to *fibrinus* Candèze (= *Agrypnus*, see p. 155).

***Agrypnus reticulatus* (Elston) comb n.**

*Lacon reticulatus* Elston, 1930 : 6.

The description is based on an unrecorded number of specimens from N. W. AUSTRALIA, Kimberley District, Nomkanbah (Dr E. Mjöberg). Elston states that the type is in the NR, Stockholm but unless that museum received only one specimen, this cannot be accepted as a valid lectotype designation. Neboiss (1956 : 12) records the presence of paratype material in the AM, Sidney.

The generic attribution is based on the description and the fact that Elston compares the species with *Lacon variabilis* Candèze (= *Agrypnus*, see p. 227).

***Agrypnus rohanchaboti* (Fleutiaux) comb. n.**

*Tylotarsus rohanchaboti* Fleutiaux, 1922b : 45.

LECTOTYPE (present designation). ANGOLA: ♂, Museum Paris, Angola Benguela Capelongo—Dongo, Mission Rohan Chabot 1914; *Tylotarsus rohanchaboti*, Fleut., type [Fleut.] (MNHN, Paris).

The second specimen mentioned in the description has not been located.

***Agrypnus rubiginosus* (Candèze) comb. n.**

*Lacon rubiginosus* Candèze, 1882 : 11.

*Lacon rubiginosus* Candèze; Neboiss, 1956 : 12.

LECTOTYPE (present designation). AUSTRALIA: ♀, Austr. sept.; *L. rubiginosus* Czdz., type [Cand.]; ex Museo van Lansberge (MNHN, Paris).

The description is based on an unrecorded number of specimens in the Lansberge collection from Australia septentrionale; Baie de Darwin.

***Agrypnus rufus* (Blackburn) comb. n.**

*Pseudolacon rufus* Blackburn, 1890 : 90.

LECTOTYPE (present designation). AUSTRALIA: ♂, 3371 [probably refers to SAM, Adelaide catalogue of Blackburn's collection see p. 270]; Type [Blackburn] Australia, Blackburn Coll. BM. 1910 : 236; *Pseudolacon rufus* Blackb. [Blackb.] (BMNH).

The description is based on an unrecorded number of specimens from Roebuck Bay sent by Mr French.

***Agrypnus rugatus* (Candèze) comb. n.**

*Tilotarsus* [sic] *rugatus* Candèze, 1857 : 174.

Holotype. MADAGASCAR: ♀, Madagascar; Sainot, Madag.; Janson coll. 1903 : 130; *Tilotarsus rugatus* Cand. [Cand.]; *Tilotarsus rugatus* Cdze., type, ex coll. Deyrolle [Janson] (BMNH).

***Agrypnus rugosus* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *rugosa* Fleutiaux, 1934b : 56.

LECTOTYPE (present designation). MADAGASCAR: ♀, Périnet, forêt côte est; *rugosa* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes. 4 ex, same locality as lectotype (MNHN, Paris). 1 ♀, same locality as lectotype with Fleutiaux's label '*Adelocera* (*Lacon*) *rugosa* Fleut.' (BMNH).

***Agrypnus rusticus* (Candèze) comb. n.**

*Tilotarsus* [sic] *rusticus* Candèze, 1893b : 13.

*Lobotarsus rusticus* (Candèze) Schwarz, 1906 : 30.

The description is based on an unrecorded number of specimens from MADAGASCAR; Nossi-Be received from M. le Dr Brancsik, of Trencsin.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♂, Madagascar, Collection Leon Fairmaire, 1906; *Tylotarsus rusticus* Cand. [Fleut.] (BMNH). The metasternum and wings are much reduced in length.

***Agrypnus sakaguchii* (Miwa) comb. n.**

*Lacon sakaguchi* Miwa, 1927 : 14; pl. 1, fig. 3.

*Adelocera* (*Adelocera*) *sakaguchi* (Miwa) Ohira, 1967b : 130.

Holotype. JAPAN: ♀, Loo-Choo, Okinawa-honto, collected by S. Sakaguchi. The location of the type is not recorded. ?Taiwan Agricultural Research Institute, Taipei.

The generic attribution is based on the description and figure.

***Agrypnus samburensis* (Fleuteaux) comb. n.**

*Lacon samburensis* Fleutiaux, 1919 : 22.

*Tylotarsus* (*Lobitarsus* [sic]) *samburensis* (Fleutiaux), 1935c : 94

LECTOTYPE (present designation). KENYA: ♂, Samburu; *Lacon samburensis* Fleut. type [Fleut.]; Fleut. Vaj. All. Jeannel. Afr. or. Elat. p. [Fleut.] (MNHN, Paris).

Paralectotype. ♂, Samburu, 30.x to 20.xi.96 (MNHN, Paris).

***Agrypnus scaber* (Candèze) comb. n.**

*Lacon scaber* Candèze, 1857 : 53.

*Lacon scaber* Candèze; Neboiss, 1961 : 9.

Holotype. MADAGASCAR: ♂, Lafert. Madagascar; ... [illegible word] Madag.?; 285; *S. scaber* Cdz. type [Cand.]; *Lacon scaber* Cdze, Cand. type. e coll. de Laferte [Janson] (BMNH).

***Agrypnus scarrosus* (Candèze) comb. n.**

*Lacon scarrosus* Candèze, 1857 : 157.

*Pyrganus scarrosus* (Candèze) Golbach, 1968 : 198.

LECTOTYPE (present designation). MEXICO: ♂ Tuspan; 761; *E. scarrosus* [Cand.]; Collection Chevrolat; *scarrosus* Cand., typ. Mon. p. 157 [Fleut.] (MNHN, Paris). The specimen stands over a green Chevrolat collection label; *Lacon scarrosus* Chevr. Cand. type Mon. 1. p. 157, no. 88, Collection Chevr. D. A. Salle.

Paralectotype. ♀, Mexico, Janson coll. 1903.130; *Lacon scarrosus* Cand. Cand. Type e coll. de Laferte [Janson]; *scarrosus*, [sic.] Mexico Chevr. [? Chevr.] (BMNH).

It is of interest to note that the lateral margins of the prothorax of the paralectotype are distinctly, if irregularly crenate. (cf. Golbach's generic diagnosis of *Pyrganus*).

***Agrypnus schwaneri* (Candèze) comb. n.**

*Lacon schwaneri* Candèze, 1874 : 73.

*Adelocera* (*Compsolacon*) *schwaneri* (Candèze); Van Zwaluwenburg, 1959 : 354.

Lectotype (Van Zwaluwenburg, 1959 : 354, see p. 9). Sex undetermined. BORNEO (RNH, Leiden). It seems probable that Van Zwaluwenburg's statement '[type] designated by Candèze' indicates that the specimen bears Candèze's determination label, possibly with the word 'type'. Candèze's second specimen, in the Van Bruck collection, was lost in the bombing of Bonn (Van Zwaluwenburg, loc. cit.).

The generic attribution is based on the description.

***Agrypnus schwarzi* (Schenkling) comb. n.**

*Lacon nebulosus* Schwarz, 1905b : 278. [Junior primary homonym of *Lacon nebulosus* Candèze, 1857.]

*Lacon schwarzi* Schenkling, 1925 : 33. [Replacement name for *nebulosus* Schwarz.]

*Adelocera schwarzi* (Schenkling) Fleutiaux, 1926 : 99.

The description is based on an unrecorded number of specimens from MADAGASCAR, Cap d'Ambre.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen. MADAGASCAR: Mont d'Ambre; *nebulosus* Schw., comparé au type [Fleut.] (MNHN, Paris).

***Agrypnus scopulosus* (Elston) comb. n.**

*Lacon scopulosus* Elston, 1924 : 204.

*Lacon scopulosus* Elston; Neboiss, 1956 : 12.

The description is based on an unrecorded number of specimens from Queensland; Coen River (*W. D. Dodd*) and Endeavour River.

Type-material (see p. 274): SAM, Adelaide, AM, Sidney.

Syntype examined. AUSTRALIA: ♂, Coen R. Q. W. D. Dodd; co-type (SAM, Adelaide).

***Agrypnus scopus* (Schwarz) comb. n.**

*Lacon scopus* Schwarz, 1902b : 200.

*Adelocera scopus* (Schwarz) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). NEW GUINEA: ♂, N. Guinea, Stephansort; coll. Schwarz; Typus; *Lacon scopus* Schw. [Schwarz] (DEI, Eberswalde).

***Agrypnus scrofa* (Candèze) comb. n.**

*Lacon scrofa* Candèze, 1873 : 4.

*Colaulon (Cryptolacon) scrofa* (Candèze); Kishii, 1964 : 26. [Good bibliography.]

LECTOTYPE (present designation). JAPAN: ♂, right hand specimen of two on one card. Kobe, 71 [underside of card mount]; Kobe; Japan, G. Lewis 1910 : 320; *Lacon scrofa* n.sp. Cdze [Lewis] (BMNH). The absence of Candèze's determination label is probably due to Lewis, who appears to have been in the habit of replacing other workers' determination labels with his own.

Paralectotypes. 1 ♂, on same card as lectotype (BMNH). 1 ♀, 416, 5/1/67; *Scrophia* [sic] Cdz. Jap. [Cand., yellow border]; collection E. Candèze; *Lacon scrofa* Cd. det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

Candèze records that he has seen a dozen specimens, but I have been unable to discover any more specimens collected on Lewis's first expedition to Japan.

***Agrypnus scrofilia* (Ohira) comb. n.**

*Colaulon (Cryplolacon) scrofilia* Ohira, 1969b : 43.

Holotype. JAPAN: ♂, Oshima Is. 28-III. 1952. *H. Ohira*. Ohira collection.

Paratypes. 2 ♂, 3 ♀, ibidem. Ohira collection.

The generic attribution is based on the description.

***Agrypnus sculptus* (Candèze) comb. n.**

*Lacon sculptus* Candèze, 1874 : 95.

*Lacon sculptus* Candèze; Neboiss, 1956 : 12.

The description is based on many specimens from the Paroo and Darling Rivers obtained from de Castelnau.

Type-material: ?IRSNB, Brussels.

The generic attribution based on the following specimens. AUSTRALIA (N.S.W.): 2 ♂, 3 ♀, 2 ex, (?sex, abdomen missing), N. Holl. Paroo; Janson coll. 1903.130. One specimen bears Gahan's determination label 'sculptus Cand.'. These specimens may be part of the syntype series.

***Agrypnus scutellaris* (Candèze)**

*Lacon scutellaris* Candèze, 1893b : 9.

*Agrypnus scutellaris* (Candèze) Nakane & Kishii, 1955 : 4.

The description is based on an unrecorded number of specimens from southern JAPAN, Liu-Kiu archipelago: Oshima.

Type-material: ?IRSNB, Brussels.

Candèze states that the species bears a resemblance to *binodulus* and *murinus*, which suggests that Nakane and Kishii's generic attribution is fully justified.

I have been unable to find the specimens from Yokohama and the other localities recorded by Lewis (1896 : 336).

***Agrypnus scutellatus* (Candèze) comb. n.**

*Lacon scutellatus* Candèze, 1857 : III.

*Archontas scutellatus* (Candèze) Fleutiaux, 1947 : 283.

The description is based on an unrecorded number of specimens from 'Des Indes - Orientales [see p. 271] et de Java', which Candèze received from de la Ferté Seneclère, Mniszech and Deyrolle.

Syntype examined. JAVA: ♀, Laf. Java; Janson coll. 1903.130; *scutellatus* [Cand.]; *Lacon scutellatus* Cdze. Cand. Type e coll. de Laferté [Janson] (BMNH). In this specimen the propleural groove mentioned in the description is very indistinct. I have been unable to trace the specimens from the Deyrolle and Mniszech collections. If Candèze retained them they should be in the BMNH or possibly the

IRSNB, Brussels. If he returned them to their owners, Deyrolle's material should be in the BMNH (see p. 274) and Mniszech's in the IRSNB, Brussels (see p. 278).

***Agrypnus semivestitus* (Elston) comb. n.**

*Lacon semivestitus* Elston, 1927 : 352.

*Adelocera* (*Compsolacon*) *semivestitus* (Elston); Van Zwaluwenburg, 1966 : 298.

The description is based on an unrecorded number of specimens from N.-W. AUSTRALIA: Wyndham (*W. Crawshaw*), N. Queensland: Townsville (*G. F. Hill*), Groote Eylandt (*N. Tyndale*).

Syntypes (see p. 274). AM, Sydney, SAM, Adelaide.

The generic attribution is based on the following specimen; AUSTRALIA: ♀, Cairns, standing as *semivestitus* Elston (SAM, Adelaide).

***Agrypnus septentrionalis* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *septentrionalis* Fleutiaux, 1934b : 50.

LECTOTYPE (present designation). MADAGASCAR: ♂, Diego Suarez; septentrionalis Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes: ♂, Diego Suarez; Alluaud; septentrionalis Fl. co-type [Fleut.]. 1 ♂, Diego S.; Museum Paris, Madagascar, coll. Perrier de la Bathie, 1906 (MNHN, Paris).

***Agrypnus serricollis* (Candèze) comb. n.**

*Lacon serricollis* Candèze, 1857 : 140; pl. 2, fig. 19.

*Adelocera serricollis* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). JAVA: ♀, Java; Janson coll. ex Candèze, 1903.130; *Lacon serricollis* Cdz. Java [Cand.]; *Lacon serricollis* Cand. Type ex coll. Candèze [Gahan] (BMNH).

Paralectotypes: 1 ♂, Dej. Java [Janson]; Janson coll. 1903.130; *Lacon serricollis* Cdz. Cand. [Janson]; *serricollis* [Cand.]; *Agrypnus serricollis* Dej. Cat. e. coll. Dejean [Janson]. 2 ♂, with labels as above but without Candèze's determination label. 1 ♂, Java; Janson coll. 1903.130; *Lacon serricollis* Cand. ex coll. Cand. [Gahan] (BMNH).

***Agrypnus serrula* (Candèze) comb. n.**

*Lacon serrula* Candèze, 1857 : 122.

*Compsolacon serrula* (Candèze) Fleutiaux, 1949 : 285.

LECTOTYPE (present designation). ♀, Laf. Ind. bor. Bacon [Janson]; Janson coll. 1903.130; *serrula* [Cand.]; *Lacon serrula* Cdz. Type e coll de Laferte [Janson] (BMNH). The specimen measures 11 mm in length compared with the published length of 10 mm.

The published locality is 'Indes-Orientales', see p. 273. The discrepancy between the published locality and the label is probably due to Janson, see p. 276.

***Agrypnus setiger* (Bates)**

*Lacon setiger* Bates, 1886 : 338.

*Agrypnus setiger* (Bates) Ohira, 1954a : 4.

LECTOTYPE (present designation). TAIWAN: ♀, Ins. Formosa; Janson coll. 1903.130; *Lacon setiger* Bates Formosa [Bates]; *Lacon setiger* Bates Type (ex coll. Bates [Janson]) (BMNH).

***Agrypnus setosus* (Schwarz) comb. n.**

*Lacon setosus* Schwarz, 1902b : 311.

*Adelocera setosus* (Schwarz) Fleutiaux, 1926 : 26.

The description is based on an unrecorded number of specimens from MADAGASCAR, Antongil Bai.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen: ♀. MADAGASCAR, Fenerive, E. Perrot; *setosus* Schw. comparé au type, Janv. 42 [Fleut.] (MNHN, Paris).

***Agrypnus setulosus* (Candèze) comb. n.**

*Lacon setulosus* Candèze, 1882 : 8.

*Adelocera setulosus* (Candèze) Fleutiaux, 1926 : 96.

Lectotype (Van Zwaluwenburg, 1959 : 352): LESSER SUNDA ISLANDS: n.sp. *setulosus* Cdz. Sumbawa Lsb. [probably Cand. with yellow border]; ex typus (IRSNB, Brussels). Not examined.

Paralectotypes. 1 ex, standing beside lectotype (IRSNB, Brussels). Van Zwaluwenburg does not record the labels on this specimen. 1 ♀, Sumbawa, Coiffs; *setulosus* Cdz. nov. sp. [Cand.]; Museum Paris, Coll. R. Oberthür, 1952. 3 ♂, same locality without determination labels (MNHN, Paris).

The description is based on six specimens from Sumbawa and Flores collected by Coiffs in the Lansberge collection. The missing specimens may now be in the MNHN, Paris (Lansberge coll. see p. 276).

***Agrypnus seyrigi* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *seyrigi* Fleutiaux, 1934b : 56.

LECTOTYPE (present designation): MADAGASCAR: ♂, Madagascar, Bekily. Reg. Sud. de l'Ile; *seyrigi* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes. 4 ♀, 2 ex, locality as lectotype. Two specimens bear Fleutiaux's determination label (MNHN, Paris).

***Agrypnus silvatica* (Fleutiaux) comb. n.**

*Adelocera silvatica* Fleutiaux, 1932c : 153.

LECTOTYPE (present designation). MADAGASCAR: ♀, Madagascar, Lavauden; Forêt de Tempina, Est Madag. Sud Tamatave; *Adelocera* (Lacon) *silvatica* Fleut. type [Fleut.] (MNHN, Paris).

***Agrypnus similis* (Fleutiaux) comb. n.**

*Tylotarsus similis* Fleutiaux, 1934b : 60.

LECTOTYPE (present designation). MADAGASCAR: ♀, Fort Dauphin, *Tylotarsus similis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 7 ex., Fort Dauphin. 2 ex., Madagascar Sud, Forêts Nord Ft. Dauphin; Museum Paris, Madagascar, Coll. Ch. Alluaud 1904. One specimen bears Fleutiaux's determination label. 4 ex., Madagascar Sud, Andrahomana, Alluaud 1900. xi. One specimen bears Fleutiaux's determination label. 1 ex., Madagascar Sud, Vallée d'Ambolo, Alluaud 1900. 1 ex, Museum Paris, Madagascar, Grandidier 1851.91. 1 ex, Museum Paris, Madagascar, Tananerive, Waterlot, 1916. 1 ex, Museum Paris, Madagascar, Province de Fort Dauphin, Antanimora, R. Decary, 1926. 8 ex, Museum Paris, Madagascar, Collection Perrier de la Bathie, 1906 (MNHN, Paris). The paralectotypes from 'entre Soanierana et Foulepointe (J. Descarpentries)' have not been located.

***Agrypnus simplex* (Candèze) comb. n.**

*Tilotarsus* [sic] *simplex* Candèze, 1874 : 110.

*Lobotarsus simplex* (Candèze) Schwarz, 1898a : 131.

LECTOTYPE (present designation): GABON: ♂, Gabon; Janson Coll. 1903 : 130; *simplex* Cdz. type [Cand.]; *Tilotarsus simplex* Cdze, type [Janson] (BMNH).

Paralectotype: ♂, Gabon, Janson coll. 1903 : 130; *Tilotarsus simplex* Cdze [Janson] (BMNH).

***Agrypnus sinensis* (Candèze) comb. n.**

*Lacon sinensis* Candèze, 1857 : 139.

*Lacon massiei* Fleutiaux, 1895a : 685. [Synonymized by Fleutiaux, 1918d : 192.]

*Compsolacon sinensis* (Candèze) Fleutiaux, 1947 : 285.

*Lacon sinensis* Candèze. LECTOTYPE (present designation). CHINA: ♀, 261; China, Dubois; *sinensis* Cand. type Mon. [Fleut.]. The specimen stands over a yellow Chevrolat label: *Lacon sinensis* Cand., type. Mon. 1. 139. 67. China, D. Dubois (MNHN, Paris).

The description is based on an unrecorded number of specimens from China in the Dohrn and Chevrolat Collections. Fleutiaux (1918d: 192) states that he possesses the type from the Chevrolat collection, but does not give sufficient information to identify the specimen. The Dohrn material may be in the IZPAN, Warsaw (see p. 274).

*Lacon massiei* Fleutiaux. LECTOTYPE (present designation). LAOS: ♂, Luang Prabang, Massie; *Lacon massiei* Fleut., type [Fleut.]; Fleut. Ann. Soc. ent. Fr. 1894 : 685 [Fleut.]; *sinensis* Cand. [Fleut.] (MNHN, Paris).

***Agrypnus singularis* (Fleutiaux) comb. n.**

*Lacon singularis* Fleutiaux, 1919 : 21.

*Adelocera singularis* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). TANZANIA: ♂, Lindi, Afrique orient. Allemande, collection Le Moul't; *Lacon singularis* Fleut., type [Fleut.]; Fleut. Voy. All. Jeann. Afr. or. Elat, p. [Fleut.] (MNHN, Paris).

***Agrypnus sinuatus* (Candèze) comb. n.**

*Lacon sinuatus* Candèze, 1857 : 102; pl. 1, fig. 16.

*Adelocera sinuatus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♀, Madagascar; Janson coll. 1903 : 130; *Lacon sinuatus* Cdze, Type (e coll. de Mniszech) [Janson] (BMNH). The absence of Candèze's determination label is probably due to Janson (see p. 276). The BMNH manuscript catalogue of the Janson collection records that it contains the type of *sinuatus* Cand. from the Mniszech collection.

***Agrypnus sjostedti* (Schwarz) comb. n.**

*Lacon sjostedti* Schwarz, 1908a : 57.

*Lobotarsus sjostedti* (Schwarz) Schenkling, 1925 : 39.

LECTOTYPE (present designation). TANZANIA: ♀, Mombo, Sjostedt; Usambara; juni; coll. Schwarz; Typus; *sjostedti* Schw. [Schw.]; *Tylotarsus* nec *Lacon* [Fleut.] (DEI, Eberswalde).

Paralectotype: ♀, Mombo, Sjostedt; typ.; *Sjostedti*; Schw. O. Schw. det. 1907; typus (NR, Stockholm).

***Agrypnus socius* (Candèze) comb. n.**

*Lacon socius* Candèze, 1874 : 87.

*Adelocera socius* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). AUSTRALIA: ♂, Cape York; Janson coll. 1903 : 130; *L. socius* type [Cand.]; *Lacon socius* Cand., type Cape York [Gahan] (BMNH).

***Agrypnus soleatus* (Candèze) comb. n.**

*Tilotarsus* (sic) *soleatus* Candèze, 1857 : 176.

*Lobotarsus soleatus* (Candèze) Schwarz, 1906 : 30.

Holotype. GUINEA: ♀, *Tylotarsus soleatus* mihi [Cand.]; *Tilotarsus soleatus* Cdze, type ex coll. de Laferté [Janson] (BMNH).

***Agrypnus soricinus* (Candèze) comb. n.**

*Lacon soricinus* Candèze, 1857 : 133; pl. 2, fig. 11.

*Adelocera soricinus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♂, Laf. Madagascar; Janson collection 1903 : 130; *Lacon soricinus* Cand. type [Cand.]; *Lacon soricinus* Cdze, Cand., Type e coll. de Laferté [Janson] (BMNH).

***Agrypnus spinifer* (Candèze) comb. n.**

*Tilotarsus* [sic] *spinifer* Candèze, 1889 : 74 (8).

The description is based on an unrecorded number of specimens from MADAGASCAR. I would expect this material to be in the IRSNB, Brussels (see p. 273) but Fleutiaux (1899 : 222) comments that the specimen in the MNHN, Paris labelled *Tilotarsus spinipes* (see below) is probably the type, 'spinipes' being a *lapsus calami*. Examination of any material extant in the IRSNB, Brussels will show whether Fleutiaux was correct in his surmise.

The generic attribution is based on the following specimen: ?♂, (genitalia missing), MADAGASCAR, Sainte Marie Cloué, 1847 Museum Paris. *Tylotarsus spinipes* sp.n. 89 [Cand.]; *spinifer* Elat. nouv. IV [Fleut.] (MNHN, Paris).

***Agrypnus spissicollis* (Candèze) comb. n.**

*Tilotarsus* [sic] *spissicollis* Candèze, 1893b : 12.

*Lobotarsus spissicollis* (Candèze) Schenkling, 1925 : 39.

The description is based on an unrecorded number of specimens from Antananarivo [MADAGASCAR].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♀, MADAGASCAR Miarinarivo; *spissicollis* Cand. comparé au type [Fleut.] (MNHN, Paris). The metasternum is much reduced and the wings entirely absent.

***Agrypnus squalescens* (Fairmaire) comb. n.**

*Tilotarsus* [sic] *squalescens* Fairmaire, 1871 : 39.

The description is based on an unrecorded number of specimens collected in MADAGASCAR by Ch. Coquerel.

Type-material: ?IRSNB, Brussels.

The generic attribution is based on a note in the Fleutiaux collection (MNHN, Paris) 'squaescens Fairm, type collection Cand., Musée de Bruxelles, ressemble à rusticus Cand., plus étroit, pronotum plus long'.

***Agrypnus squalida* (Fleutiaux) comb. n.**

*Adelocera squalida* Fleutiaux, 1927 : 76.

LECTOTYPE (present designation). CAMBODIA: ♂, Camboge, Kampong Thon, Vitalis; *Adelocera* (*Lacon*) *squalida* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus squameus* (Szombathy) comb. n.**

*Adelocera squamea* Szombathy, 1909 : 118; fig. 1.

*Adelocera squamea* var. *obscura* Szombathy, loc. cit.

LECTOTYPE (present designation). E. AFRICA (position unknown): ♀, Afr. or. Katona; Mto-ja-Kifarou; Holotypus 1909 *Adelocera squamea* Szombathy [Kaszab] (TM, Budapest).

Paralectotype. ♀, locality as lectotype, labelled 'Paratype *Adelocera squamea* Szombathy' by Kaszab. (TM, Budapest).

I have also examined two ♀ from the same locality labelled as the paratype of *Adelocera squamea* var. *obscura* Szombathy by Kaszab. All four specimens agree well with the descriptions and despite the absence of Szombathy's determination labels I believe that they form the original syntype-series.

***Agrypnus stictus* (Candèze) comb. n.**

*Lacon stictus* Candèze, 1895b : 56.

*Adelocera stictus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens collected in Madagascar, Diego-Suarez by Alluaud.

Type-material: ?MNHN, Paris. Not located, 1971.

The generic attribution is based on the following specimen; MADAGASCAR: ♂, Ste Marie de Madagascar; *stictus* Cand., comparé au type XI. 43 [Fleut.] (BMNH).

***Agrypnus stigmosus* (Elston) comb. n.**

*Lacon stigmosus* Elston, 1927 : 352.

*Lacon stigmosus* Elston; Neboiss, 1956 : 13.

The description is based on an unrecorded number of specimens from N.W. Australia: Derby and N. Queensland: Normanton (*R. Kemp*).

Type-material (see p. 274): SAM, Adelaide, AM, Sydney, NM, Victoria.

The generic attribution is based on two syntypes; AUSTRALIA: 2 ♀, Queensland; *Lacon stigmaticus* Elston Cotype [?Elston] (SAM, Adelaide).

***Agrypnus stricticollis* (Fairmaire) comb. n.**

*Lacon stricticollis* Fairmaire, 1881 : 266.

*Adelocera stricticollis* (Fairmaire) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from the Viti Islands [Fiji]. Fairmaire records that he received material for his work on the fauna of these islands from Godeffroy of Hamburg, but does not state whether he retained any or all of it. Any material retained by Fairmaire should be in the IRSNB, Brussels or MNHN, Paris (see history of the Fairmaire collection, p. 275) but up to the present time it has not been located. The MNHN, Paris contains a specimen from Ins. Fidji (Watkins) determined by Fleutiaux with a note 'comp. au type Mus. Brux. Nov. 32'. Godeffroy (Horn & Kahle, 1935 : 91) did not retain any duplicate material in his museum, which was broken up in 1885, part being acquired by the Zoological Museum, Hamburg.

The generic attribution is based on the following specimens which may be part of the syntype-series. FIJI: 2 ♂, Viti, 81 : 50 [BMNH registration number = purchased of Godeffroy Museum, Hamburg, 1881]. One specimen bears a label 'Lacon sticticollis [sic] Fairm.' in an unknown hand (BMNH).

***Agrypnus suarezi* nom. n.**

*Lobotarsus maculatus* Schwarz, 1905b : 280.

*Agrypnus maculatus* (Schwarz) **comb. n.** [Junior secondary homonym of *Agrypnus maculatus* Macleay, 1872.]

The description is based on an unrecorded number of specimens from Madagascar, Diego Suarez.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen; MADAGASCAR: Mt. de Ambre, Nov.; *Lobotarsus maculatus* Schw. comp. au type [Fleut] (MNHN, Paris).

***Agrypnus subcarinulatus* (Schwarz) comb. n.**

*Lacon subcarinulatus* Schwarz, 1908a : 82.

*Adelocera subcarinulatus* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR, Mont d'Ambre.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on Schwarz's comment that the species bears a resemblance to *sulcicollis* Schwarz (see p. 219). A note in the Fleutiaux collection

(MNHN, Paris) states '*subcarinulatus* Schw. vu type = *crenatus* Klug'. Fleutiaux did not publish the synonymy.

***Agrypnus subcervinus* (Fleutiaux) comb. n.**

*Lacon subcervinus* Fleutiaux, 1916 : 219.

*Adelocera subcervinus* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). PHILIPPINES: ♀, Luzon, Mont. Trimay; *Lacon subcervinus* Fleut., type [Fleut] (MNHN, Paris).

***Agrypnus subcylindricus* (Schwarz) comb. n.**

*Lacon subcylindricus* Schwarz, 1908c : 93.

*Adelocera subcylindricus* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR, Mont d'Ambre.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen: MADAGASCAR: ♀, Diego Suarez; *subcylindricus* Schw. comp. au type [Fleut.] (MNHN, Paris).

***Agrypnus submarmoratus* (Elston) comb. n.**

*Lacon submarmoratus* Elston, 1924 : 205.

*Lacon submarmoratus* Elston; Neboiss, 1956 : 13.

The description is based on an unrecorded number of specimens from [AUSTRALIA] Queensland: Cairns (*A. H. Lea*).

Type-material (see p. 274): SAM, Adelaide, AM, Sydney, NM, Victoria.

The generic attribution is based on the following specimens; AUSTRALIA: 1 ♂, 2 ♀, from the type-locality standing as co-types of *submarmoratus* Elston (SAM, Adelaide).

***Agrypnus subocellatus* (Candèze) comb. n.**

*Lacon subocellatus* Candèze, 1882 : 6.

*Adelocera subocellatus* (Candèze) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from Nossi Bé [MADAGASCAR].

Type-material: ?IRSNB, Brussels, but see below.

The generic attribution is based on the following specimen, MADAGASCAR: ♂, Nossi Bé, recu du Boyer; *Lacon subocellatus* Cdz. type [Cand.] (MNHN, Paris). This specimen may be part of the syntype series.

***Agrypnus suboculatus* (Candèze) comb. n.**

*Tylotarsus* [sic] *suboculatus* Candèze, 1882 : 13.

*Lobotarsus suboculatus* (Candèze) Schwarz, 1906 : 30.

The description is based on an unrecorded number of specimens from Antananarivo [MADAGASCAR].

Type-material: ?IRSNB, Brussels.

The generic attribution is based on the following specimen: ♀, MADAGASCAR, Vohemar, Coll. Le Moul't; *Tylotarsus suboculatus* Cand. [Fleut] (BMNH).

***Agrypnus subsericeus* (Candèze) comb. n.**

*Lacon subsericeus* Candèze, 1878a : 102.

*Adelocera subsericeus* (Candèze) Fleutiaux, 1926 : 96.

Holotype. NEW GUINEA, Hatam (*Beccari*) ?MCSN, Genoa.

The generic attribution is based on the description.

***Agrypnus subserratus* (Quedenfeldt) comb. n.**

*Tylotarsus subserratus* Quedenfeldt, 1886 : 24; pl. 1, figs 14, 14a & b.

*Lobotarsus subserratus* (Quedenfeldt) Schwarz, 1906 : 30.

LECTOTYPE (present designation). ♀, *Tylotarsus subserratus* Qdf. Qgo [Qued.]; Ex Museo Quedenfeldt (MNHN, Paris).

The published locality is Quango [= Kwango or Cuango] River, collected by v. Mechow. The exact location is unknown.

***Agrypnus substriatus* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *substriata* Fleutiaux, 1934b : 55.

LECTOTYPE (present designation). MADAGASCAR: ♂, Madagascar, Forêt Tanala, Alluaud, 1901; Museum Paris, Madagascar, coll. Alluaud, 1904; *substriata* Fleut., type [Fleut] (MNHN, Paris).

Paralectotypes. 1 ♂, 1 ♀, same locality and collection as lectotype but without determination labels. 1 ♀, Museum Paris, Madagascar, Mahasinjo, Coll. J. Chatanay, 1914. 1 ♀, Nanisana: Madagascar, Tananarive (MNHN, Paris).

***Agrypnus subtuberculatus* (Schwarz) comb. n.**

*Lobotarsus subtuberculatus* Schwarz, 1898a : 132.

The description is based on an unrecorded number of specimens from Kameroun [CAMEROUN], collected by Conrad and submitted by Kraatz.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen. EQUATORIAL GUINEA: Benito, Congo franc.; *Lobotarsus subtuberculatus* Schw. [Schwarz] (MNHN, Paris).

***Agrypnus suillus* (Candèze) comb. n.**

*Lacon suillus* Candèze, 1857 : 159.

*Pyrganus suillus* (Candèze) Golbach, 1968 : 198.

Holotype. MEXICO: Dej. Mexico; Janson coll. 1903.130; *Lacon suillus* (Dej.) Cand. Cand. Type [Janson]; *Agrypnus suillus* Dej. coll. e coll. Dej. [Janson] (BMNH). The abdomen is missing. The absence of Dejean and Candèze determination labels is probably due to Janson (see p. 276).

***Agrypnus sulcicollis* (Schwarz) comb. n.**

*Lacon sulcicollis* Schwarz, 1908a : 73.

*Adelocera sulcicollis* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from MADAGASCAR, Antananarivo.

Type-material: ?DEI, Eberswalde.

The generic attribution based on the following specimen; MADAGASCAR: ♀, Antongil; *sulcicollis* Schw., comparé [Fleut.] (MNHN, Paris).

***Agrypnus taciturnus* (Candèze) comb. n.**

*Lacon taciturnus* Candèze, 1874 : 60.

*Adelocera (Adelocera) taciturna* (Candèze); Ohira, 1967b : 103.

The description is based on an unrecorded number of specimens from LAOS in the Janson and Candèze collections.

Syntypes examined. 1 ♂, Muhot, Laos; Janson coll. 1903.130; *Lacon taciturnus* Cand. Laos (Mouhot) [Gahan]. 1 ♂, Muhot, Laos; Janson coll. 1903.130; *L. taciturnus* Cdz. [Cand.]; *Lacon taciturnus* Cand., Cotype, Laos [Gahan] (BMNH). The IRSNB, Brussels may contain additional syntype specimens, see notes on the Candèze collection, p. 000.

*Agrypnus colonicus* (Candèze) may be conspecific with this species, see p. 141.

Miwa (1934 : 168) placed *Paralacon koshunensis* Miwa (1929 : 233) in synonymy with *taciturna* Candèze and Ohira (1969c : 28) treats *koshunensis* [sic] as a subspecies of *taciturna*. Clarification of the status of *koshunensis* must be postponed until the type-material has been located and examined.

***Agrypnus tactus* (Candèze) comb. n.**

*Lacon tactus* Candèze, 1874 : 67.

*Adelocera tactus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). THAILAND. ♂, Janson coll. 1903 : 130; *tactus* Cdz, type [Cand.]; *Lacon tactus* Cand., type. Siam [Gahan] (BMNH).

***Agrypnus taiwanus* (Miwa) comb. n.**

*Lacon taiwanus* Miwa, 1927 : 13; pl. 1, fig. 2.

Syntypes. FORMOSA: 4 ex., Baibara (*A. Saito*), Koshun (*J. Sonan*), Horisha and Arisan (Dr *S. Matsamura*). The location of the material is not recorded. ?Taiwan Agricultural Research Institute, Taipei.

The generic attribution is based on the description.

***Agrypnus tectus* (Fleutiaux) comb. n.**

*Tylotarsus* (*Lobitarsus* [sic]) *tectus* Fleutiaux, 1935c : 92.

LECTOTYPE (present designation). KENYA: Turner – McArthur, Lower Tana – Sabaki, April-May 1932; *Tylotarsus tectus* Fleut. [Fleut.] (MNHN, Paris).

Paralectotype. ♀, same locality as lectotype and bearing Fleutiaux's determination label (NM, Nairobi).

***Agrypnus tellini* (Fleutiaux) comb. n.**

*Lacon tellini* Fleutiaux, 1903c : 250.

*Adelocera tellini* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). ETHIOPIA: ♂, Ghinda; Erithrée Tellini; *Lacon tellini* Fleut., type [Fleut.]; Bull. Soc. Ent. Fr. 1903 p. 290 [Fleut.] (MNHN, Paris).

***Agrypnus terminata* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *terminata* Fleutiaux, 1934b : 53.

LECTOTYPE (present designation) ♀, MADAGASCAR, Maevetanana; *terminata* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus testaceus* (Schwarz) comb. n.**

*Centrostethus testaceus* Schwarz, 1908d : 10.

The description is based on an unrecorded number of specimens from Madagascar, Antananarivo.

Type-material: ?DEI, Eberswalde.

The generic attribution is based on the following specimen: ♂, MADAGASCAR: Marvansetra; Decembre; *Centrostethus testaceus* Schwarz comparé [Fleut.] (MNHN, Paris).

***Agrypnus thomasi* nom. n.**

*Homeolacon gracilis* Blackburn, 1890 : 91.

*Agrypnus gracilis* (Blackburn) **comb. n.** [Junior secondary homonym of *Agrypnus gracilis* (Candèze, 1874).]

LECTOTYPE (present designation). AUSTRALIA: ♂, 2800, T., N.T. [on card mount, see p. 270]; Australia, Blackburn coll. BM 1910.236; *Homeolacon gracilis* Blackb. [Blackb.] (BMNH). The published locality is 'Northern Territory'.

Paralectotypes. IRSNB, Brussels and SAM, Adelaide according to Neboiss (1956 : 15 and 1961 : 10). Not examined.

***Agrypnus thibetanus* (Reitter) stat. nov., comb. nov.**

*Compsolacon crenicollis* var. *thibetanus* Reitter, 1913 : 658.

The description is based on numerous specimens from Thibet: Poo, West Himalaya submitted by Spichal.

Type-material: ?TM, Budapest.

The generic attribution is based on the following specimens: CHINA: 1 ♀, Poo, West. Hym. Coll. Spichal; *thibetanus* Rtt [?Reitter]; *lapideus* Cand. [Fleut.] 1 ♂, same locality; *Compsolacon thibetanus* Rtt [Fleut.] (MNHN, Paris). These specimens are probably part of the syntype-series.

These specimens are not conspecific with the specimens from the Caucasus standing as *crenicollis* in the BMNH and MNHN, Paris.

***Agrypnus tigrinus* (Fleutiaux) comb. n.**

*Lacon tigrinus* Fleutiaux, 1919 : 23.

*Adelocera tigrinus* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). TANZANIA: ♂, Dar es Salaam; *Lacon tigrinus* Fleut., type [Fleut.]; Fleut. Voy. All. & Jeann. Afr. or Elat. p. [Fleut.] (MNHN, Paris).

***Agrypnus tonkinensis* (Fleutiaux) comb. n.**

*Adelocera tonkinensis* Fleutiaux, 1927 : 81.

*Colaulon (Sagojyo) tonkinensis* (Fleutiaux) Kishii, 1964 : 34.

LECTOTYPE (present designation). NORTH VIETNAM: ♀, Tonkin, Lac Tho, Hoa Binh. A. de Cooman; *tonkinensis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 35 ex, same locality labels as lectotype; 4 specimens bear Fleutiaux's determination label (MNHN, Paris). 1 ♂, 7 ♀, same locality labels as lectotype; 4 ♀ specimens bear Fleutiaux's determination labels (BMNH).

The material recorded from Hoa Binh (L. Dupont) by Fleutiaux has not been located.

***Agrypnus torrefactus* (Candèze) comb. n.**

*Lacon torrefactus* Candèze, 1857 : 128.

*Adelocera torrefactus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). ♀, Deyr. India [Janson]; 283; Janson coll. 1903.130; *Lacon torrefactus* Cdze Type e coll. Deyrolle (BMNH). [Janson] (BMNH).

Paralectotype. 1 ♀, Deyr. India; *Lacon torrefactus* Cdze. Cand. e. coll. Deyrolle [Janson] (BMNH). The published locality is 'Indes-Orientales'. see p. 271.

***Agrypnus torresi* (Candèze) comb. n.**

*Lacon torresi* Candèze, 1897 : 10.

*Lacon torresi* Candèze; Neboiss, 1956 : 13.

LECTOTYPE (present designation). AUSTRALIA: ♂, Thursday Isd.; n.sp. 1894, *torresi* Cand. Thursday Island [Cand.]; *Lacon torresi* Cand. det. E. Candèze [IRSNB curatorial label]; Collection E. Candèze (IRSNB, Brussels).

The published locality is Cape York. Thursday Island lies about 20 miles off Cape York. The specimen agrees well with the description, except that it is 14.5 mm long compared with the published length of 13 mm.

***Agrypnus tostus* (Candèze) comb. n.**

*Lacon tostus* Candèze, 1857 : 129.

*Adelocera tostus* (Candèze) Fleutiaux, 1926 : 98.

Holotype. ♂, Deyr. India [Janson]; 373; Janson coll. 1903.130; *L. tostus* [Cand.] *Lacon tostus* Cdze, type e coll. Deyrolle [Janson] (BMNH).

The published locality is 'Indes-Orientales', see p. 271.

***Agrypnus transversicollis* (Fleutiaux) comb. n.**

*Adelocera transversicollis* Fleutiaux, 1927 : 80.

LECTOTYPE (present designation). LAOS: ♂, Xieng-Khouang; 12.5.9 [sic, ?1919]; *Adelocera transversicollis* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 3 ♂, 1 ♀, same locality as the lectotype, one bears Fleutiaux's determination label (MNHN, Paris).

I have not found the syntype specimens from LAOS: Tranninh, juin (*Vitalis de Salvaza*) and ANNAM: Kieng-Trap, mai (*Vitalis de Salvaza*).

***Agrypnus transversus* (Candèze) comb. n.**

*Lacon transversus* Candèze, 1857 : 123.

*Adelocera transversus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). ♀ Laf. Ind. bor. Bacon [Janson]; Janson

coll. 1903.130; transversus [Cand.] *Lacon transversus* Cdze. Cand. Type e coll. de Laferté [Janson] (BMNH).

The description is based on material from 'Indes-orientales' (see p. 271) in the de la Ferté and Deyrolle collections. I have been unable to locate the specimens from the Deyrolle collection.

***Agrypnus tripartitus* (Candèze) comb. n.**

*Lacon tripartitus* Candèze, 1874 : 54.

*Adelocera tripartitus* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). MADAGASCAR: ♀, *Lacon* n.sp. [Janson]; *tripartitus* Cdz [Cand.] *Lacon tripartitus* type Cand. [Gahan] (BMNH).

***Agrypnus truncatus* (Herbst) comb. n.**

*Elater truncatus* Herbst, 1806 : 95; pl. 166, fig. 2.

*Lacon cylindricus* Candèze, 1857 : 121. [Synonymized by Candèze, 1891c : 20.]

[*Lacon melancholicus* Candèze; Candèze, 1892 : 484. Misidentification.]

*Adelocera truncatus* (Candèze) Fleutiaux, 1926 : 96.

*Elater truncatus* Herbst. LECTOTYPE (present designation). ♂, Hbst.; 16121 [NMHU, Berlin, museum catalogue number, refers to information on following label]; India or. Westerm.; *truncatus* n. *Elat. truncatus* Hbst., *cylindricus* Cand., Ind. or. Hbst. [Gerstaecker, yellow paper] (NMHU, Berlin).

Paratypes. 2 ♂, 1 ♀, India or. Westerm. No. 16121 (NMHU, Berlin).

*Lacon cylindricus* Candèze. LECTOTYPE (present designation). ♂, Laf. N. India, Bacon [Janson]; Janson coll. 1903.130; 42; *Lacon cylindricus* Cdze, Cand., e coll. de Laferté [Janson] (BMNH).

Paralectotype ♂, labels as lectotype, but bearing the number 43 (BMNH).

The published locality is 'des Indes-orientales', (see p. 271). Janson (see p. 276) is probably responsible for the discrepancy between the published locality and the labels and also for the absence of Candèze's determination label.

Schenkling (1925 : 27) lists *jurulosus* Candèze as a synonym of *truncatus* Herbst but gives no reason for doing so. I have been unable to trace the type-material of *jurulosus* (see p. 172).

Other material examined. INDIA: Barwai, Chota Nagpore, 1892, 1 ♀. Nagpore, 10 ♀ (IRSNB, Brussels). None of the specimens bear Candèze's determination label but all carry the IRSNB curatorial label '*Lacon melancholicus* Cd.'. They are probably the specimens recorded by Candèze (1892 : 484).

***Agrypnus truquii* (Candèze) comb. n.**

*Lacon truquii* Candèze, 1874 : 101.

*Pyrganus truquii* (Candèze) Golbach, 1968 : 198.

LECTOTYPE (present designation). MEXICO: ♂ 22832 [Fry manuscript catalogue no. = Type, Mexico, San Carlos, Truqui]; Truqui, Mexico; Fry coll. 1905 : 100, *L. truquii* Cdz, type [Cand.]; *Lacon truquii* Cand., Type, Mexico [Fry] (BMNH).

Paralectotype. ♂, Oaxaca, Mexico, Salle; *Lacon truquii* Cand. Salle coll. 1424 [unknown manuscript, the number refers to the locality recorded in Salle's manuscript catalogue] B.C.A. Col. 111 (1), *Lacon truquii* Cand. [Champ.] (BMNH).

***Agrypnus tuberculatus* (Candèze) comb. n.**

*Tilotarsus* [sic] *tuberculatus* Candèze, 1874 : 109.

*Lobotarsus tuberculatus* (Candèze) Schwarz, 1906 : 30.

LECTOTYPE (present designation). ANGOLA: ♂, Benguela; *T. tuberculatus* Cdz, n.sp., type [Cand.]; *Tilotarsus tuberculatus* Cdze, type [Janson] (BMNH).

***Agrypnus turbatus* (Candèze) comb. n.**

*Lacon turbatus* Candèze, 1893e : 169.

*Adelocera turbatus* (Candèze) Fleutiaux, 1926 : 98.

The description is based on two specimens of unequal size (10–12 mm) from Belgaum, in the state of Bombay [INDIA] submitted by Andrewes. The BMNH possesses two female specimens from this locality. The paralectotype recorded below measures 9.5 mm in length. The other from the Janson collection bears only Jansons label 'L.n.sp? allied to *torrefactus* Cand.' As it is also 9.5 mm long, it cannot be the second syntype. The male specimen in the IRSNB, Brussels carries the locality Kanara [Madras State]. However, the fact that Candèze's determination label bears the words 'Bombay' and 'And.'[rewes] suggests that either he overlooked the locality label or that it was not there at the time. Since the specimen is 12.5 mm long and agrees very well with the description, I have no hesitation in accepting it as the second syntype.

LECTOTYPE (present designation). INDIA: ♂, Kanara [probably erroneous, see above] nov. sp. 1893, *turbatus* Cand. Bombay, And. [Cand., yellow border]; Collection E. Candèze; *Lacon turbatus* Cd. det. E. Candèze [IRSNB] curatorial label] Ex typis. (IRSNB, Brussels).

Paralectotype. INDIA: ♀, Belgaum; 272; co-type; *Lacon turbatus* Cd. [Andrewes]; Andrewes Bequest, BM. 1922–221 (BMNH).

***Agrypnus turbidus* (Germar) comb. n.**

*Lacon turbidus* Germar, 1840 : 263.

*Adelocera turbidus* (Germar) Fleutiaux, 1926 : 96.

The description appears to be based on specimens bearing the manuscript name *Agrypnus turbidus* received from Dupont (Germar, 1840 : 440). Candèze (1857 : 99) states that he received (presumably on loan) Germar's 'exemplaire typique' from

the Berlin Natural History Museum. However the two specimens in the NMHU, Berlin standing beside Gerstaecker's blue label 'turbidus Germ. Cand. Madag. Goud.' are 18 mm and 19 mm long compared with the published length of 7 lines ( $\triangleq$  15 mm). The discrepancy in the length and the fact that the specimens came from Goudot makes it impossible to accept them as part of the syntype-series. The specimens are conspecific with the lectotype. The DEI, Eberswalde does not possess any specimens determined by Germar. For the history of the Germar collection see p. 275.

LECTOTYPE (present designation). MADAGASCAR: ♂, turbidus Dup. nodifer Kl.? Madagascar [Germar]; Janson coll. ex Schaum, 1903 : 130 (BMNH).

***Agrypnus turkistanicus* (Schwarz) comb. n.**

*Lacon turkistanicus* Schwarz, 1902b : 198.

*Adelocera turkistanicus* (Schwarz) Fleutiaux, 1926 : 96.

The description is based on an unrecorded number of specimens from TURKISTAN, Buchara.

Type-material: ?IRSNB, Eberswalde.

The generic attribution is based on the following specimen: ♀, locality illegible, determined by Dolin (BMNH).

***Agrypnus tuspanensis* (Candèze) comb. n.**

*Lacon tuspanensis* Candèze, 1857 : 157.

*Pyrganus tuspanensis* (Candèze) Golbach, 1968 : 198.

LECTOTYPE (present designation). MEXICO: ♀, type; *L. tuspanensis* [Cand.] Collection Chevrolat; *tuspanensis* Cand., type Mon. p. 157 [Fleut]. The specimen stands over a green Chevrolat label: *Lacon tuspanensis* Cand., type Mon. 1. p. 157, 89 transversus Chevr. Mexico, Tuspan. D. A. Sallé (MNHN, Paris).

Paralectotypes. 1 ♂ [not ♀ as labelled], Laf. Mexico; Janson coll. 1903.130; *Lacon tuspanensis* Cdze, Cand. Type e coll. de Laferté [Janson]. 1 ♀ [not ♂ as labelled], Laf. Mexico; Janson coll. 1903. 130; *Lacon tuspanensis* Cadze, Cand. e coll. de Laferté [Janson]; transversus Chevr. Mexico [? Chevr] (BMNH).

The wrong sex signs were probably attached by Champion (see p. 9).

***Agrypnus unicolor* (Hope) comb. n.**

*Mecynocanthus unicolor* Hope, 1838 : 53.

The description is based on a single specimen in Resin Animè in 'Mr Strong's superb collection'. The locality is given as 'India orientali'.

I have been unable to find this material. It is not in the Hope collection in Oxford. Strong's collection of shells and fine specimens of amber containing

insects was sold by auction by J. C. Stevens on 6th April 1891 (*Nature*, April, 1881: CLXXI and *Athenaeum*, April, 1891: 247). Through the kindness of Mr D. B. Janson I have been able to examine a sale catalogue annotated by his grandfather. Lots 116 to 121 made up of 'Specimens of Amber containing insects of various orders' have a pencil note "gum copal" beside them. Four lots were purchased by Sowerby and two by Fulton. As these gentlemen were dealers it must be assumed that the specimens were sold privately, and are now lost. The figure depicts an individual with drawn out and sharply pointed anterior angles of the prothorax. This feature does not occur in any known Indian species but is characteristic of a number of Madagascan species. Champion (1916: 245) suggested that Hope may have been mistaken in the origin of his resin and that *unicolor* was a pallid form of the Madagascan *Centrostethus cuspidatus* (Klug). This may well be the case as Hope (loc.cit.: 48, footnote) records that he also received Animè from Madagascar.

The generic attribution is based on the close resemblance of the figure to *Agrypnus cuspidatus* (Klug).

### ***Agrypnus unicus* (Fleutiaux) comb. n.**

*Lacon unicus* Fleutiaux, 1919: 21.

*Adelocera unicus* (Fleutiaux) Fleutiaux, 1926: 96.

Holotype. TANZANIA: ♂, Afrique orientale allemande, Kilimandjaro versant sud-est Alluaud & Jeannel; Prairies alpine du Bismarkhügel (alt. 2600-2800, mars-avril 1912, st. 70); *Lacon unicus* Fleut., type (MNHN, Paris).

### ***Agrypnus ursulus* (Candèze) comb. n.**

*Lacon ursulus* Candèze, 1857: 147.

*Lacon ursulus* Candèze; Neboiss, 1956: 13.

LECTOTYPE (present designation). AUSTRALIA: ♀, Laf. Sydney, N. Holl. *ursulus* Cdz, type [Cand.]; Janson coll. 1903.130; *Lacon ursulus* Cdze, Cand. type e coll. de Laferté [Janson] (BMNH).

The metasternum and wings are much reduced in length.

### ***Agrypnus vandepolli* (Candèze) sp. rev., comb. n.**

*Lacon Van-de-Polli* Candèze, 1887b: 285.

LECTOTYPE (present designation). AUSTRALIA: ♀, Normantown, Queensland (Ch. French); *Lacon Van de Polli* Cand. Type [? Van de Poll]; Collection Neervoort Van de Poll, type de Candèze [Fleut.] (MNHN, Paris).

Neboiss (1965: 13), following Schenkling (1925: 30), lists *vandepolli* as a synonym of *variabilis* Candèze. Comparison of the descriptions indicates that the synonymy is not justified. *L. vandepolli* possesses golden scales and deep tarsal grooves on the propleurae, characteristics which do not occur in *variabilis*. I believe that the

synonymy in the Schenkling catalogue is due to a printers error, the name *variabilis* being indented and in italics. Fleutiaux (1926 : 98) published a correction indicating that *variabilis* is a good species but this appears to have been overlooked by Neboiss.

***Agrypnus variabilis* (Candèze) comb. n.**

*Lacon variabilis* Candèze, 1857 : 148.

*Lacon variabilis* Candèze; Neboiss, 1956 : 13.

LECTOTYPE (present designation). AUSTRALIA: ♀, Janson coll. ex Candèze, 1903 : 130; *Lacon variabilis* Cdz. Austr. [Cand.]; *Lacon variabilis* Cand. Australia [Gahan] (BMNH).

I have not been able to trace any specimens determined as *variabilis* var. a or var. b. by Candèze.

This species, which occurs in Queensland and South Australia, is the only representative of the subfamily recorded from New Zealand. Sharp (1877 : 479), who first reported the species from Auckland, suspected that it was imported by marine traffic. The following records suggest that the species is now fairly well established.

NEW ZEALAND: N. Island. Auckland, 8 ex.; Papakura, 15.viii.24 and 30.v.39 (*Richardson*), 2 ex; Matakana, 11.iv.36 (*Clarke*), 1 ex; Wayby Gorge, 29.xii.1926 (*Clarke*), 1 ex; Ohakuna, 20.xi.1919 (*Harris*), 1 ♂, 1 ♀; Wellington, 2 ex; S. Island, Waiwhero (Motueka), Nr. Neslon, 2.ix.1949, 1 ♂; Picton (*Walker*), 2 ex; Greymouth (*Helms*). 1 ♂; Blackball, xii.1916 (*Harris*), 1 ♀ (BMNH).

Candèze (1891 : 24) places *alternans* MacLeay, 1872 in synonymy with *variabilis* Candèze. The species is unknown to me so that the synonymy has not been confirmed. Neboiss (1956 : 13), following Schenkling (1925 : 30), lists *maculosus* MacLeay, 1888 as a synonym of *variabilis*. This synonymy does not appear to have been published previously and comparison of the descriptions suggests that it is not justified. *L. maculosus* is smaller in size (about 7.4 mm) than *variabilis* (10–12 mm) and possesses patches of reddish yellow scales and propleural tarsal grooves, characteristics which do not occur in *variabilis*. I believe the catalogue synonymy is due to a printer's error, the line '*maculosus* M'Leay (nec Cand.)', etc., being placed above the line '*variatus* nom. nov.' instead of in its correct place below it. Schenkling (1925 : 30) proposed *L. variatus* as a new name for *L. variegatus* Schwarz, 1906, which is a junior secondary homonym of *L. variegatus* (Motschulsky, 1854). *L. variegatus* Schwarz was proposed as a new name for *L. maculosus* MacLeay, 1888, a junior primary homonym of *L. maculosus* Candèze, 1874. *Lacon variatus* Schenkling, 1925 is a junior primary homonym of *L. variatus* Candèze, 1890. If *maculosus* MacLeay (type-material in MacLeay Museum, University of Sidney according to Neboiss) is found to be a good species, it will require another new name.

***Agrypnus variatus* (Candèze) comb. n.**

*Lacon variatus* Candèze, 1890 : CXLVIII.

*Adelocera variatus* (Candèze) Fleutiaux, 1926 : 98.

The description is based on a number of specimens collected by Cardon at Chota Nagpore (see p. 273).

The type-material has not been located.

The generic attribution is based on the following specimen. INDIA: ♀, Chota Nagpor. Bengal; *L. variatus* Cand. C. R. Soc. Ent. Belge. 1890: 148 [? Fleut.] (MNHN, Paris). The specimen may be part of the syntype-series.

***Agrypnus variolus* (Candèze) comb. n.**

*Lacon variolus* Candèze, 1874 : 92.

*Lacon variolus* (Candèze) Neboiss, 1956 : 14.

Lectotype (Van Zwaluwenburg, 1959 : 354, see p. 9). AUSTRALIA: ♀, N. Holl. Q'land; Janson coll. ex Candèze, 1903.130; *Lacon variolus* Cdz. n.sp. Queensland [Cand.]; *Lacon variolus* Cand. Type ex coll. Cand. [Gahan] (BMNH).

The description is based on a number of specimens in the Candèze and Janson collections. There are no more specimens from Janson collection in the BMNH. The IRSNB, Brussels may possess additional specimens.

***Agrypnus versicolor* (Fleutiaux) comb. n.**

*Adelocera* (*Archontas*) *versicolor* Fleutiaux, 1932a : 51.

Holotype. ♀, MADAGASCAR: Brickville; Cap Refroigney Colonel Grimlet; *versicolor* Fleut. type [Fleut.] (MNHN, Paris).

***Agrypnus vestitus* Klug comb. n.**

*Elater* (*Agrypnus*) *vestitus* Klug, 1833 : 66 (1834 : 154).

*Lacon vestitus* (Klug) Germar, 1840 : 264.

*Lacon tumidicollis* Candèze, 1857 : 108. [Synonymized by Candèze, 1874 : 53.]

*Adelocera vestitus* (Klug) Fleutiaux, 1926 : 96.

*Elater* (*Agrypnus*) *vestitus* Klug. LECTOTYPE (present designation). MADAGASCAR: ♂, 16095 [Museum catalogue number = Madagascar, Goudot]; Madag. Goud. (ZMHU, Berlin).

Paralectotypes. 3 ♀, Madagascar, Goud. Nr. 16095 (ZMHU, Berlin).

The specimens stand beside a blue Gerstaecker label: *vestitus* Germ. *Elater vestitus* Klug. Madag. Goud. The absence of Klug's label is probably due to Gerstaecker (see p. 275).

*Lacon tumidicollis* Candèze. LECTOTYPE (present designation). ♀, Laf. Madagascar; Janson coll.; *Lacon tumidicollis* Cdz., Cand. type e coll. de Laferté; Monstrosité individu de *vestitus* [Cand.] (BMNH).

GERMAR'S INTERPRETATION OF *Lacon vestitus* (KLUG). It is impossible to tell from Germar's work whether he owned specimens of this species or whether his

knowledge of the species was based on Klug's description. Germar's collection was broken up (see p. 275). Neither the DEI, Eberswalde nor the NMHU, Berlin contain specimens of *vestitus* Klug, *petitti* Dej. from 'Cap'. The BMNH collection contains a male and female from the Schaum collection. The male, which lacks the abdomen, bears a small blue triangular label with the word 'Mad.' and a larger blue label with the words 'vestitus Kl., petitti Dej. Madag.' in a handwriting I believe to be that of Germar. The label also bears the words 'Afr. mer.' which have been crossed out. The female bears a small blue triangular label with the letters 'Dp.' probably standing for Dupont, and Candèze's label 'L. vestitus'. The specimens are conspecific with the lectotype. The male was used in the preparation of the table on p. 20. *A. vestitus* (Klug) has not been recorded from South Africa.

***Agrypnus vicinus* (Fleutiaux) comb. n.**

*Lacon vicinus* Fleutiaux, 1919 : 19.

*Adelocera vicinus* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). E. AFRICA: ♂, Zanguebar (see p. 44); 265; *Lacon vicinus* Fleut., type [Fleut.]: Fleut. Voy. All. Jeann. Afr. or Elat. p. [Fleut.] (MNHN, Paris).

Paralectotype. ♂, Mandura, Zanguebar; *Lacon vicinus* Fleut., co-type [Fleut.] (MNHN, Paris).

***Agrypnus victoriae* (Candèze) comb. n.**

*Lacon victoriae* Candèze, 1865 : 12.

*Lacon victoriae* Candèze; Neboiss, 1956 : 14.

LECTOTYPE (present designation). AUSTRALIA: ♀, N. Holl. Melbourne C. Cdze; Janson coll. ex Candèze, 1903.130 *Lacon victoriae* Cdz. Austr. [Cand.]; *Lacon victoriae* Cdze. Type ex coll. Cand. [Janson] (BMNH).

Paralectotype. ♂, N. Holl. Melbourn. C. Cdze.; Janson coll. ex Candèze 1903.130 (BMNH).

***Agrypnus viettei* (Girard) comb. n.**

*Archontias viettei* Girard, 1970 : 25.

Holotype. MADAGASCAR: ♂, massif du Tsaratanana, matsabory en dessous de l'Andohanisambirano, 1,900 m [2,050 m], xii. 1964 (*P. Soga*). (MNHN, Paris).

Paratype. 1 ♂, same locality as holotype (Girard collection, Laboratoire de Zoologie, Ecole normale supérieure, Paris).

Both specimens bear Girard's determination labels.

***Agrypnus vitalisi* (Fleutiaux) comb. n.**

*Lacon vitalisi* Fleutiaux, 1918d : 190.

*Adelocera vitalisi* (Fleutiaux) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). NORTH VIETNAM: ♂, Region de Hanoi; *Lacon vitalisi* Fleut., type [Fleut.] (MNHN, Paris).

***Agrypnus wallacei* (Candèze) comb. n.**

*Lacon wallacei* Candèze, 1874 : 80.

*Adelocera wallacei* (Candèze) Fleutiaux, 1926 : 96.

LECTOTYPE (present designation). SULAWESI: ♂, Tandano, Celebes; Janson coll. 1903.130; *L. wallacei* Cdz. [Cand.]; *Lacon wallacei* Cand., type [Gahan] (BMNH).

Candèze (loc.cit.) recorded a variety from Macassar. The BMNH collection contains 3 specimens from Macassar, Janson coll. One bears Gahan's label '*Lacon wallacei* Cand. Var.'. These specimens are not conspecific with the lectotype. They belong to a species unknown to me.

***Agrypnus yuppe* (Kishii) comb. n.**

*Colaulon* (*Sagojyo*) *yuppe* Kishii, 1964 : 31; pl. 2, figs 1, 2, 7, 9.

*Sagojyo yuppe* (Kishii) Ohira, 1967b : 103.

Holotype. JAPAN: ♀, Is. Kuchi-us-erabu in Kagoshima Prefecture, July 29, 1963. Presumably in Kishii collection.

The generic attribution is based on the following specimen: 1 ♀, Hatsuno Amami-Oshima, 28-VII. 1862; determined by Ohira, 1968 (BMNH).

***Agrypnus zanzibaricus* nom. n.**

*Tilotarsus* [sic] *marmoratus* Candèze, 1878b : LIV (8).

*Agrypnus marmoratus* (Candèze) **comb. n.** [Junior secondary homonym of *Agrypnus marmoratus* (Candèze, 1874).]

The description is based on material collected in Zanzibar in the course of Raffray's expedition.

Type-material: MCZN, Genoa according to Candèze (1878b : LIV).

The generic attribution is based on the following specimens. TANZANIA: 1 ♂, Zanzibar Raffray; *Tilotarsus marmoratus* Cdz. [Cand.]. 1 ♀, Zanzib.; Museum Paris, Coll. Leon Fairmaire, 1906; *Tilotarsus marmoratus* Cdz. [Cand.] Cand. det. (MNHN, Paris).

***Agrypnus zietzi* (Blackburn) comb. n.**

*Lacon zietzi* Blackburn, 1985 : 48.

*Lacon zietzi* Blackburn; Neboiss, 1956 : 14.

The description is based on an unrecorded number of specimens taken at Lake Callabonna (S. AUSTRALIA) by Mr Zietz. Unexpectedly (see p. 270) the species is not represented in the BMNH collection.

According to Neboiss, the type-material is in the SAM, Adelaide.

The generic attribution is based on the description.

**MERISTHUS** Candèze

Subgenus *Meristhus* Candèze, 1857 : 162. Type-species: *Elater lepidotus* Palisot de Beauvois, by original designation.

*Rhaciaspis* Arnett, 1952 : 121. Type-species: *Elater lepidotus* Palisot de Beauvois, by original designation.

Subgenus *Sulcimerus* Fleutiaux, 1947 : 255. Type-species: *Meristhus quadripunctatus* Candèze, by subsequent designation (Arnett, 1955 : 617).

**GENERIC DIAGNOSIS.** Each tarsal claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepimeron and mesepisternum do not form part of margin of mesocoxal cavity (Text-fig. 2). Second and third antennal segments cylindrical, not triangular like the fourth and following segments (Text-fig. 13). Antennal groove extending beyond the anterior half of the prosternopleural suture and deep enough to accommodate the rolled antennae. Body clothed with scales. Prothorax not restricted behind the anterior angles; lateral carinae attain the anterior margins. Propleurae with (*Meristhus* s. str.) or without (subgenus *Sulcimerus*) depressions for the reception of the anterior tarsus. Scutellum with distinct median longitudinal carina. Tarsi simple, without ventral lobes.

**HISTORY OF THE GENUS.** Candèze established the genus for those species in which the scutellum bears a longitudinal carina.

There has been some difference of opinion concerning the type-species of *Meristhus*. Golbach (1969a) discusses the problem, which probably stems from the fact that not only did Hyslop (1921 : 656) designate *scrobinula* [sic] Candèze as the type-species, but Candèze, who was not in the habit of designating type-species for the genera he established, has already on two occasions made statements which, in my opinion, amount to the designation of the type-species of *Meristhus*.

Candèze (1857 : 162), writing of *Meristhus*, states 'ce petit genre, qui a pour type l'espèce suivante, se distingue des *Lacon* et tous les autres Agrypnides par la conformation tout particulière de l'écusson'. The first species, both in the key and in the text is *lepidotus* Palisot de Beauvois. I believe that Fleutiaux (1941e : 47) was fully justified in accepting this statement as a valid designation of the type-species of *Meristhus*. Forty years later Candèze (1897 : 12), in describing *M. erinaceus* from Borneo, remarks that this species is 'un peu plus grande que la *M. scobinula* [from China] type du genre...'. It seems probable that on this occasion Candèze referred to *scobinula* as the type-species either because he has forgotten his earlier statement or, because he was at that time dealing only with oriental species. Hyslop's designation is clearly not based on Candèze (1897) as he states that it is a 'present designation'. Why he selected this species is unknown, but his choice may well have been influenced by the fact that *scobinula* occurs in Mexico.

In the absence of intermediate forms, the retention of the subgenus *Sulcimerus*, which includes those species possessing grooves on the propleurae for the accommodation of the anterior tarsi, appears justified at the present time. However, when the four species at present unknown to me (see below) and additional material belonging to the genus is available, it may become apparent that, as in *Agrypnus*, this characteristic is of no value above the specific level.

**SEXUAL DIMORPHISM.** The sexes appear to be indistinguishable externally.

DISTRIBUTION. Africa, Madagascar, India, Indonesia, Southern U.S.A.

BIOLOGY AND HABITS. The larvae of *Meristhus* (*Sulcimerus*) *niponensis* Lewis live in the ground (Ohira, 1962). A *Meristhus* sp. near *lepidotus* Palisot de Beauvois commonly occurs on the fore dunes of the eastern South African seaboard. The adults have been found burrowing in the sand, usually in the neighbourhood of the dune plants, on which the larvae (which are unknown) probably feed (Callan, 1964 : 128).

#### THE SPECIES INCLUDED IN THE GENUS

The Schenkling catalogue (1925 : 35) lists the names of 22 species, of which two are regarded as synonyms of *scobinula* Candèze. Two species have been described since the publication of the catalogue. The assignment of eight species to *Meristhus* (s.l.) has been confirmed and the *scobinula* Candèze-*texasus* Horn synonymy provisionally accepted. Fleutiaux (1947 : 457) transferred three species to *Rismethus* and eight additional species are transferred to that genus in the present work. The remaining four species, *erinaceus* Candèze, *indecorus* Candèze, *ornatulus* Candèze and *longicollis* Candèze are unknown to me.

#### *Meristhus* (*Meristhus*) *angulicollis* Fairmaire

*Meristhus angulicollis* Fairmaire, 1897 : 382.

The description is based on an unrecorded number of specimens collected at Suberbieville [MADAGASCAR] by Perrier.

Type-material: ? MNHN, Paris, or possible IRSNB, Brussels (see p. 275). Up to the present time no specimens from the type-locality with Fairmaire's determination label have been located in the MNHN, Paris.

The generic attribution is based on the following specimens which may be syntypes; MADAGASCAR: 1 ♀, Suberbieville (Perrier); *Meristhus angulicollis* Fairm. t. Fleut. 1 ♂, 1 ♀, Madg<sup>r</sup>, Suberb<sup>le</sup>, H. Perrier; Museum Paris, Madagascar, coll. Perrier de la Bathie. The female bears Fleutiaux's determination label (MNHN, Paris). 2 ex, Suberbieville, 1903.28; *Meristhus angulicollis* Fairm. (BMNH). The registration number refers to a collection, including 'paratypes', purchased from Donckier.

#### *Meristhus* (*Meristhus*) *lepidotus* (Palisot de Beauvois)

*Elater lepidotus* Palisot de Beauvois, 1805 : 11; Coleoptera, pl. 7, fig. 6.

*Lacon lepidopteris* Chevrolat, 1852 : 631. [Unjustified emendation.]

*Meristhus lepidotus* (Palisot de Beauvois) Candèze, 1857 : 163.

*Meristhus lepidotus* var. *a* (*Agrypnus bohemanii* Dej. in la Ferté Mus.) Candèze, 1857 : 163.

LECTOTYPE (present designation). NIGERIA: ♂, Benin; Janson coll. 1903.130; *Elater lepidotus* P. de B., *Agrypnus lepidotus* Dej. ex coll. Dejean (Palisot de Beauvois) [Janson]; *Meristhus lepidotus* Pal. de Beauv. Cdze, type [Janson] (BMNH).

Paralectotype: ♂, Benin, *Meristhus lepidotus* P. de B. Cdze, ex coll. Dejean (Palisot de Beauvois) [Janson] (BMNH).

According to Horn & Kahle (1925 : 201) Palisot de Beauvois' collection passed to the BMNH via Dejean, Janson and Godman and Salvin. The absence of de Beauvois' labels is probably due to Janson (see p. 276).

Fleutiaux (1919 : 15) states that de Beauvois' type from Oware [sic] cited by Chevrolat (1852 : 631) is in his collection (now in the MNHN, Paris). In my opinion this specimen (see below) cannot be the type. Palisot de Beauvois recorded *lepidotus* from 'près de la ville de Benin'. He obviously regarded Oware as an entirely different locality describing it as 'pays voisin de la ligne et limitrophe du Royaume de Benin' (1805, introduction to the Flore de Oware et de Benin en Afrique). Oware is almost certainly the district of Owerri in the Eastern Province of Nigeria. The only specimen (♀) in the Fleutiaux collection from the Chevrolat collection and obviously the one to which Fleutiaux refers bears the following labels: 2 grey labels with illegible numbers [? reference to locality list now lost]; *lepidotus*; *Agrypnus lepidotus* ? P.B. 11, pl. t.6 [next words illegible] ex Mus. Ol. [Chevrolat, according to note by Fleutiaux on the underside of the label]; *lepidotus* Coll. Beauv. (coll. Oliv.) Cand det., typique Mon. [Fleut.]; Fleut. Voy. Alluaud et Jeannel Elat. p. [Fleut.]. Fleutiaux was probably misled into believing this to be de Beauvois' type by Chevrolat's statement (1852 : 630) that he had purchased part of Palisot de Beauvois' collection and the fact that the species was marked with an asterisk in Chevrolat's work indicating that it was represented in his collection. The specimen is conspecific with the lectotype.

*Meristhus lepidotus* var. *a* Candèze. LECTOTYPE (present designation). SUDAN: Nubia; Janson coll. 1903.130; *Meristhus lepidotus* Pal. de B. var. *Cdze*, *Agrypnus bohemanni* Dej. ex coll Dejean [Janson] (BMNH). The absence of Candèze's, la Ferté Sécotière's or Dejean's labels is probably due to Janson (see p. 276).

### ***Meristhus (Meristhus) squameus* Candèze**

*Meristhus squameus* Candèze, 1893 : 10.

The description is based on an unrecorded number of specimens collected at Boma, Bas Congo [ZAIRE], by Tschoffen.

Type-material: ? IRSNB, Brussels.

The generic attribution is based on the description.

### ***Meristhus (Sulcimerus) cristatus* Horn comb. rev.**

*Meristhus cristatus* Horn, 1871 : 299; pl. 4, fig. 2.

*Rismethus cristatus* (Horn) Golbach, 1969a : 141.

Holotype. ♂, dark steel-blue paper disk (? indicates California); Type, 8144; *Meristhus cristatus* Horn [Horn] (MCZ, Harvard).

The description is based on a single specimen collected by John Xantus at Cape San Lucas (between San José del Cabo and La Paz according to Horn (1894 : 302)), California.

For the explanation why this specimen is in the MCZ, Harvard and not the ANS, Philadelphia, see note on the Xantus collection, p. 281.

***Meristhus (Sulcimerus) insignitus* Candèze**

*Meristhus insignitus* Candèze, 1874 : 103.

LECTOTYPE (present designation): CEYLON: ♀, Ceylon; *Meristhus insignitus* Cdz. [Cand.]; *Meristhus insignitus* Cand. type [Janson]; sides of prothorax with oblique foveae for reception of anterior tarsi [Janson]; Janson coll. 1903.130 (BMNH).

Paralectotype: ♀, labels as lectotype but without Candèze's determination label.

***Meristhus (Sulcimerus) niponensis* Lewis**

*Meristhus niponensis* Lewis, 1894 : 30.

LECTOTYPE (present designation). JAPAN: ♀, 6.9.81 [underside of card mount]; Niigata, 4.ix-16.ix; *Meristhus niponensis* Lewis, type [Lewis]; Japan, G. Lewis. 1910 : 320 (BMNH).

Lewis states that he had 'several specimens'. Only the one designated as the lectotype has been located. The others may have been given away by Lewis.

***Meristhus (Sulcimerus) quadripunctatus* Candèze**

*Meristhus quadripunctatus* Candèze, 1857 : 163.

LECTOTYPE (present designation). ♂, India bor. [Janson]; Janson coll. 1903.130; *Meristhus quadripunctatus* Cdze. Type ex coll. Laferté [Janson] (BMNH).

The description is based on an unrecorded number of specimens from 'Sylhet [E. PAKISTAN] et l'Assam' received from de la Ferté Sénectère and Deyrolle. The discrepancy in the published locality and the label and the absence of Candèze's determination label is probably due to Janson (see p. 276). The material from the Deyrolle collection has not been located.

***Meristhus (Sulcimerus) scabrosus* Fleutiaux**

*Meristhus scabrosus* Fleutiaux, 1931 : 74.

*Meristhus (Sulcimerus) scabrosus* Fleutiaux, 1947 : 156.

LECTOTYPE (present designation). SOUTH VIETNAM: ♀, Museum Paris, Nhatrang, A. Krempf, 1913; Types; *Meristhus scabrosus* Fleut., types [Fleut.] (MNHN, Paris). Length 6 mm.

Paralectotype, ♀, length 6.5 mm, on the same card mount as the lectotype.

**RISMETHUS** Fleutiaux

*Rismethus* Fleutiaux, 1947 : 257. Type-species: *Meristhus scobinula* Candèze, by original designation.

**GENERIC DIAGNOSIS.** Each tarsal claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum and mesepimeron do not form part of the margin of the mesocoxal cavity (Text-fig. 2). Second and third antennal segments cylindrical, not triangular like the fourth and following segments (Text-fig. 13). (Golbach, 1969a : 141, corrected the printer's error in Fleutiaux's paper concerning the length of the second and third antennal segments.) Antennal groove not extending beyond the anterior half of the prosterno-pleural suture but deep enough to accommodate the rolled antennae. Body clothed with scales. Prothorax constricted immediately behind the anterior angles; lateral carina does not attain the anterior margin. Propleurae and metasternum with depressions for the reception of the anterior and middle tarsi, but never with well defined grooves. Scutellum simple or with a longitudinal carina. Tarsi simple, without ventral lobes.

The constriction of the prothorax immediately behind the anterior angles is the only characteristic distinguishing the members of this genus from *Agrypnus* and *Meristhus*. Another characteristic feature, the abbreviated lateral carina of the prothorax also occurs in certain *Agrypnus* species, e.g. *flavescens* Candèze. As more material becomes available it may become apparent that the shape of the prothorax is not of sufficient importance to warrant the retention of the genus. However, since no intermediate forms are known at the present time the genus has been retained in this work.

**HISTORY OF THE GENUS.** The genus was established for species congeneric with *scobinula* Candèze, which Fleutiaux considered could not be included in the same genus (*Meristhus*) as *lepidotus* Palisot de Beauvois and *quadripunctatus* Candèze. According to Fleutiaux, the distinctive features of the genus are that the scutellum is simple and that the metasternal tarsal depressions are less strongly impressed than those on the propleurae. Study of the available material has shown that these characters are of no importance at the generic level and the genus is here redefined.

**SEXUAL DIMORPHISM.** The sexes appear to be indistinguishable externally.

**DISTRIBUTION.** Madagascar, Ceylon, ?Burma ('Ind. or.'), Indonesia, China, Samoa, Texas and Central America.

**BIOLOGY AND HABITS.** Nothing is known of the life history and habits of the species included in the genus.

THE SPECIES INCLUDED IN THE GENUS *RISMETHUS*

Fleutiaux included three species in the genus. Golbach (1969a : 141) transferred *cristatus* Horn and *squamiger* Champion to the genus. The generic assignment of the latter is confirmed. In my opinion there is no justification for the inclusion of *cristatus*, in which the prothorax is not constricted behind the anterior angles, in *Rismethus*. Seven species are newly assigned to *Rismethus*.

***Rismethus apicalis* (Candèze) comb. n.**

*Meristhus apicalis* Candèze, 1874 : 103.

LECTOTYPE (present designation). CELEBES: ♀, Celebes/C.W.; Janson coll. 1903.130; ex coll. Wallace; *Meristhus apicalis* Cdz. [Cand.]; *Meristhus apicalis* Cdz., type [Janson] (BMNH).

Paralectotype. 1 ex., TIMOR, C.W.; Janson coll. 1903. 130; *Meristhus apicalis* Cdz. Cand. [Janson] (BMNH).

***Rismethus diodesmoides* (Motschulsky)**

*Brachylacon diodesmoides* Motschulsky, 1861b : 118.

*Meristhus biguttatus* Candèze, 1893 : 10. [Synonymized by Fleutiaux, 1932e : 79.]

*Rismethus diodesmoides* (Motschulsky) Fleutiaux, 1947 : 257.

*Brachylacon diodesmoides* Motschulsky. LECTOTYPE (present designation) ♀, 'C' on yellow paper circle [? = CEYLON]; *Brachylacon diodesmoides* Motsch. Ind. or. Ceylon [Motsch.]; Genus *Brachylacon* Cand., Fleutiaux det. [Fleut.] (ZMU, Moscow).

Paralectotype: ♀, yellow paper circle (ZMU, Moscow).

The description is based on an unrecorded number of specimens from Ceylon.

*Meristhus biguttatus* Candèze. The description is based on an unrecorded number of specimens from Perak [? Island or region W. MALAYSIA].

Type-material: IRSNB, Brussels, according to Fleutiaux (1947 : 237).

The acceptance of the synonymy is based on the examination of a number of specimens from Perak standing as *biguttatus* in the BMNH. These specimens may be part of the syntype series.

***Rismethus erinaceus* (Candèze) comb. n.**

*Lacon erinaceus* Candèze, 1874 : 74.

*Meristhus erinaceus* (Candèze) Fleutiaux, 1926 : 97.

LECTOTYPE (present designation). BORNEO: ♂, Sarawak/C.W.; Janson coll. 1903 : 130; *Lacon erinaceus* (type) Cand. [Cand.]; *Lacon erinaceus* Cand., type, Sarawak [Gahan] (BMNH).

***Rismethus minusculus* (Candèze) comb. n.**

*Meristhus minusculus* Candèze, 1874 : 104.

LECTOTYPE (present designation). BORNEO: Sarawak, bearing Candèze's determination label (MCSN, Genoa).

Not examined, details of labels unknown to me.

The generic attribution is based on a report on the specimen kindly supplied by Dr D. Guiglia.

***Rismethus mocquerysi* (Fleutiaux) comb. n.**

*Meristhus mosquerysi* Fleutiaux, 1899 : 223.

LECTOTYPE (present designation). MADAGASCAR: ♀, Baie d'Antongil; *Meristhus mocquerysi* Fleut., type [Fleut.] (MNHN, Paris).

***Rismethus nigrutilus* (Candèze) comb. n.**

*Meristhus nigrutilus* Candèze, 1893b : 10.

Lectotype (van Zwaluwenburg, 1959 : 355, see p. 9). SUMATRA: sex and details of labels not recorded. Van Zwaluwenburg's comment 'Candèze's designation' suggests that the specimen bears Candèze's determination label with the word 'type'. (RSNB, Brussels). Not examined.

Paralectotypes: 2 ex., recorded by Van Zwaluwenburg (IRSNB, Brussels). Not examined.

The generic attribution is based on the following specimens which may be part of the syntype-series: 1 ex., Sumatra; *Meristhus nigrutilus* Cand. Cand det [Cand.]. 1 ex., Palembang, Sumatra (MNHN, Paris).

The published locality is Sumatra, Palembank [sic].

***Rismethus oceanicus* (Van Zwaluwenburg) comb. n.**

*Meristhus oceanicus* Van Zwaluwenburg, 1945 : 95; fig. 1.

Holotype. SAMOA: ? ♀, government garden, Taputimu, Tutuila, Samoa, Aug. 7 at 100 ft, sweeping sweet potato plants. Zimmerman (BPBM, Honolulu). Not examined.

Paratypes: 3 ex., locality as lectotype (BPBM, Honolulu) 1 ex, ibidem (HSPA, Honolulu). Not examined.

The generic attribution is based on the description.

***Rismethus perraudieri* (Fleutiaux)**

*Meristhus perraudieri* Fleutiaux, 1889 : 139.

*Rismethus perraudieri* (Fleutiaux) Fleutiaux, 1947 : 255.

LECTOTYPE (present designation). SOUTH VIETNAM: ♀, QN; *Meristhus perraudieri* Fleut., type, Quinhon Annam [Fleut.] (MNHN, Paris).

The published locality is Qui-Nhon.

***Rismethus pistrinarius* (Candèze) comb. n.**

*Meristhus pistrinarius* Candèze, 1857 : 164.

LECTOTYPE (present designation). ♂, Ind. bor. [sic., Janson]; 49; Janson coll. 1903.130; *Meristhus pistrinarius* Cdze, type ex. coll. Laferté [Janson] (BMNH).

Paralectotype: 1 ex., Ind. bor. [sic., Janson]; 49; Janson coll. 1903.130; *Meristhus pistrinarius*; ex coll. Laferté [both Janson] (BMNH).

The description is based on an unrecorded number of specimens from 'Des Indes Orientales' from the La Ferté and Deyrolle collections. The discrepancy between the published locality and the labels is almost certainly due to Janson (see p. 276). The specimens from the Deyrolle collection have not been located.

### *Rismethus scobinula* (Candèze)

*Meristhus scobinula* Candèze, 1857 : 164; pl. 2, fig. 26.

*Meristhus texanus* Horn, 1871 : 300; pl. 43, fig. 1. [Synonymized by Horn, 1875 : 148.]

*Rismethus scobinula* (Candèze) Fleutiaux, 1947 : 257.

*Meristhus scobinula* Candèze. Candèze states that this species is found in China and Mexico but his comments in the last paragraph on page 165 concerning Chevrolat's Mexican specimen suggest that the description is based on a specimen or specimens from China. The remarks by Lewis (1894 : 30) 'it appears clear that his type example came from China' adds support to this opinion. Fleutiaux's (1919 : 15) statement that he possesses the type of Candèze's Monograph, a specimen from Teapa (Mexico) sent by Pilate to Chevrolat cannot be accepted as a valid lectotype designation.

LECTOTYPE (present designation). CHINA: ♂, China; Janson coll. 1903.130; ex coll. Candèze; *Meristhus scobinula* Cdz., Chine [Cand.]; *scobinula* Cdze, type Mon. [Janson] (BMNH).

*Meristhus texanus* Horn. LECTOTYPE (present designation). U.S.A.: ♀, Tex.; Lectotype 3830 [Museum curatorial label, designation unpublished] *Meristhus scobinula* Cdz., *texanus* Horn [?Horn] (ANS, Philadelphia). The description is based on two specimens from Texas collected by Belfrage. The second specimen cannot be found in the ANS, Philadelphia. If it is not in Belfrage's collection (USNM, Washington according to Horn & Kahle, 1935 : 15), I believe that the following specimen should be regarded as the Paralectotype: ♀, Texas, 74.12 [BMNH registration number = Belfrage, Texas]; *Meristhus texanus* [Horn] (BMNH).

The comparison of the external characteristics and male genitalia of Chinese and American specimens in the BMNH has served only to confirm the synonymy. However, the distribution, which is of a type unusual in the Elateridae, suggests that a critical investigation into the structure, life history and habits of individuals from the two regions is desirable.

Candèze (1891 : 26) placed *M. setarius* Chevrolat, 1867 : 596 in synonymy with *scobinula* Candèze. The description is based on an unrecorded number of specimens from 'Cuba. Collections de MM. Gundlach et Poëy'. According to Horn & Kahle (1935 : 100) the Gundlach collection is in the Instituto de Enseñanza de la Habana, Cuba (not examined) and the Poëy collection (Horn & Kahle, 1936 : 211) passed to the American Entomological Society, Philadelphia (not examined). Chevrolat (1864 : 425) acquired Poëy's first Cuban collection and also duplicates from later

collections but these specimens cannot be found in his collection in the MNHN, Paris.

Lewis (1894 : 30) recorded *scobinula* from Japan. The BMNH collection contains three specimens, one with Lewis's determination label, from the Lewis collection. These specimens, in which the metathorax is reduced in length and wings are absent, are not conspecific with the lectotype of *scobinula* Candèze.

### *Rismethus squamiger* (Champion)

*Meristhus squamiger* Champion, 1894 : 269; pl. 11, fig. 14.

*Rismethus squamiger* (Champion) Golbach, 1969a : 141.

LECTOTYPE (present designation). Right hand of two specimens on one card, right antenna missing, GUATEMALA: ♂, Duenas, Guatemala, G. C. Champion; BCA coll. III(1) *Meristhus* [printed] *squamiger* [Champ.]; sp. figured (BMNH).

Paralectotypes: Specimen beside lectotype and 7 ex, with same locality and determination labels as the lectotype (BMNH). 2 ex, ibidem (MNHN, Paris). 2 ex, Guatemala City, 500 ft, Champion; determination labels as lectotype. 2 ex on one card, San Geronimo, Vera Paz, Champion; determination label as lectotype. 1 ex, Capetillo, Guatemala, G. C. Champion; determination label as lectotype. 1 ex, Santarem, Bates coll.; Janson coll. 1903.130; *squamiger* Ch. [Champ.]; *Meristhus scobinula* Cdz. [Janson]. 2 ex, Teapa, Mexico; Janson coll. 1903 : 130; *squamiger* Champ. [Champ.]; *Meristhus scobinula* Cdze [Janson] (BMNH).

### *TRIERS* Candèze

*Triers* Candèze, 1900 : 78 (3). Type-species: *Triers ramitarsas* Candèze, by monotypy.

GENERIC DIAGNOSIS. Each tarsal claw with a group of setae near the base (Text-fig. 11). Tibial spurs absent (Text-fig. 10). Mesepisternum and mesepimeron do not form part of the margin of the mesocoxal cavity (Text-fig. 2). Second and third antennal segments small, subequal, each smaller than the fourth and following segments (Text-fig. 13). Antennal groove not extending beyond the anterior two-thirds of the prosternopleural suture. Body clothed with scales. Prothorax not constricted behind the anterior angles; lateral margin of the prothorax carinate. Propleurae and metasternum without distinct grooves or depressions for the reception of the tarsi of the anterior and middle legs. Scutellum without longitudinal carina. First four tarsal segments expanded laterally (Text-fig. 17).

HISTORY OF THE GENUS. The genus was established for a single species from Australia which differs from all other known Agrypninae in that the first four tarsal segments are expanded laterally.

SEXUAL DIMORPHISM, BIOLOGY AND HABITS. Nothing is known of the life history and habits of this species. It is not known whether this species displays sexual dimorphism.

### THE SPECIES INCLUDED IN THE GENUS

At the present time only one species is known.

*Triers ramitarsus* Candèze

*Triers ramitarsus* Candèze, 1900 : 78 (3).

The description is based on an unrecorded number of specimens from Australia, probably from the northern part of the continent.

Type-material: IRSNB, Brussels according to Neboiss (1956 : 15). Not confirmed.

The generic attribution is based on the following specimen; AUSTRALIA: ♂, Northern Territory; BM 1968.196; determined from the description, CMFH (BMNH).

*LANELATER* Arnett

[*Agrypnus* sensu auct., nec Eschscholtz, 1829. Misinterpretation.]

*Amaurus* Castelnau, 1840 : 23. Type-species: *Amaurus senegalensis* Castelnau (= *Lanelater notodonta* (Latreille)), by subsequent designation (Hyslop, 1921 : 625). [Homonym of *Amaurus* Burmeister, 1835, Hemiptera.]

*Lanelater* Arnett, 1952 : 105. Type-species: *Agrypnus schotti* LeConte, by original designation.

GENERIC DIAGNOSIS. Each claw bearing a group of setae near the base (Text-fig. 11). Tibial spurs present (Text-fig. 9). Mesepisternum and mesepimeron form part of the margin of the mesocoxal cavity (Text-fig. 1). The third antennal segment never resembling the fourth in shape, but often considerably longer than the second segment. Antennal groove variable in depth but extending at least three-quarters of the length of the prosternopleural suture.

Body clothed with setae; scales are entirely absent. Propleurae and metasternum without depressions or grooves for the accommodation of the anterior and middle tarsi. Prothorax simple, without a constriction behind the anterior angles; lateral carinae present. Scutellum simple, without longitudinal carina. Tarsi simple, without ventral lobes.

RANGE OF VARIATION FOUND WITHIN THE GENUS. In general the species included in the genus bear a close resemblance to one another. The greatest range of variation is found in the antennal groove, which varies considerably in length and depth from one species to another.

HISTORY OF THE GENUS. Arnett established the genus *Lanelater* for 'those species which were formerly placed in the genus *Agrypnus*' sensu auct., nec Eschscholtz, 1829 (type-species *Elater tomentosus* Fabricius, see below) but which, since Lane's (Arnett, 1952 : 105) discovery that Westwood (1838, Synopsis, p. 26) had properly designated *Elater murinus* Linnaeus as the type-species of *Agrypnus* (see p. 114), could no longer be accommodated in that genus. The next available generic name for these species is *Amaurus* Castelnau, 1840 (type-species *Amaurus senegalensis* Castelnau) but this name is pre-occupied by *Amaurus* Burmeister, 1835.

The interpretation of *Agrypnus* as a genus containing only species congeneric with *tomentosus* can be traced to Candèze (1857, see p. 114). Before that time the genus was poorly defined and in addition to *murinus* and *tomentosus*, included species now assigned to *Lacon* (e.g. *atomarius* Fabricius = *punctatus* Herbst), *Danosoma* (*fasciatus* Linnaeus), *Alaus* (*moerens* Germar) and *Aliteus* (*adspersus* Herbst). Hyslop's designation of *tomentosus* as the type-species was probably made not so much because it heads Eschscholtz's list of species but because it corresponded with the interpretation of *Agrypnus* at that time.

**SEXUAL DIMORPHISM.** In the majority of species there are no obvious differences between the sexes. In a few species (e.g. *aequalis* (Candèze)) the antennae of the males are longer than those of the females. In some other species (e.g. *babaulti* (Fleutiaux)) the females are larger and have a stouter appearance than the males.

**DISTRIBUTION.** The genus is represented in all parts of the world except South America.

**BIOLOGY AND HABITS.** The early stages of the larva of *L. fuscipes* (Fabricius) have been described and figured by Fletcher (1919). The larvae of this species and of *L. mastersi* (Macleay) are predaceous and may be of some economic importance. It seems probable that the larvae of *fuscipes* attack larvae of *Oryctes rhinoceros* Lesne in Mauritius and the larvae of *mastersi* are believed to play an important part in keeping down the numbers of Rutelid and Melolonthid larvae, which are serious pests of sugar-cane plantations in Australia (Illingworth, 1921 : 16).

#### THE SPECIES INCLUDED IN THE GENUS

Arnett states that the genus is moderately large and that current catalogues list 80 species (Palaeartic, 9; Indomalaysian, 30; Australian and Oceanic, 7; Africa and Madagascar, 31; Americas, 3). It is not immediately clear how Arnett arrives at these figures. The most probable explanation appears to be that they are based on the Schenkling (1925) catalogue of *Agrypnus* without taking into account the species which appear more than once (e.g. *aequalis* Candèze occurs both in the Indomalaysian region and Australia) or the corrections and additions listed in the addenda and corrigenda at the end of the second volume. Schenkling lists the following number of species in each section: Palaeartic, 9; Indomalaysian, 28; Australian and Oceanic, 7; Africa and Madagascar, 28 and the Americas, 3. With the addition of two Indomalaysian species (*lopezei* Fleutiaux, 1934 and *pescadoriensis* Miwa, 1934) and three African species (*acuminatus*, *confusus* and *proximus* Fleutiaux, 1935) described subsequently, these figures agree with Arnett's.

In the catalogue which follows, the species listed in the uncorrected Schenkling catalogue together with the five above mentioned species are assumed to have been transferred to *Lanelater* by Arnett, 1952 : 105. All others are recorded as new combinations.

*Lanelater* is the only genus included in the Agrypninae in which scales are entirely absent. This characteristic together with the long antennal grooves and the presence of tibial spurs makes the generic attribution of specimens and in many cases of species known only from the description a relatively simple matter. It has therefore been considered unnecessary to record the data on the specimen or specimens on which the generic attribution is based.

#### *Lanelater acuminatus* (Fleutiaux)

*Agrypnus acuminatus* Fleutiaux, 1935c : 90.

*Lanelater acuminatus* (Fleutiaux) Arnett, 1952 : 105.

LECTOTYPE (present designation). EAST AFRICA, location unknown: ♂, McArthur, Thua R., Nov. 33; *Agrypnus acuminatus* Fleut., type [Fleut.] (MNHN, Paris).

The locality Thua River does not appear in any gazetteer known to me. The BMNH collection contains specimens, believed to be conspecific with the lectotype, from KENYA, Turkana.

### *Lanelater aequalis* (Candèze)

*Agrypnus aequalis* Candèze, 1857 : 25.

*Agrypnus insularis* Fairmaire, 1891 : LXX. [Synonymized by Fleutiaux, 1923 : 409.]

*Lanelater aequalis* (Candèze) Arnett, 1952 : 105.

*Agrypnus aequalis* Candèze. LECTOTYPE (present designation): ♀, C.M. [probably indicating 'Collection Mniszech'] type [? Cand.]; specimen typiq. sur laquel a été établie l'espèce 1857 [Cand.]; *Agrypnus aequalis* Cand. det. E. Candèze [IRSBNB curatorial label] (IRSBNB, Brussels).

The description is based on an unrecorded number of specimens from 'Des Indes Orientales' in the Mniszech collection. The reason for absence of Candèze's determination label is unknown.

*Agrypnus insularis* Fairmaire. LECTOTYPE (present designation). SEYCHELLES: ♀, Seychel; *Agrypnus insularis* Fairm. Seychelles [Fairm.]; Type [? Fairm.]; C. Fairm.; *Agrypnus insularis* Fairm. det L. Fairm.; Type, insularis; Sec S. Schenkling Col. Cat. Junk XI. 1935-27, p. 4. *Agrypnus aequalis* Cand. [the last three labels are all modern IRSBNB curatorial labels] (IRSBNB, Brussels).

Paralectotypes. 1 ♂, insularis Fairm. Seychelles [Fairm.]; sondaicus var. loc. insularis Frm. Seychelles [Cand., blue border]; insularis Fairm. Seychelles [Fairm.]; *Agrypnus insularis* Fairm. det. E. Fleutiaux [IRSBNB curatorial label]; collection E. Candèze. 1 ♂, Seychelles; C. Fairm.; *Agrypnus insularis* Fairm. det L. Fairmaire [IRSBNB curatorial label]; Collection E. Candèze (IRSBNB, Brussels). 1 ♀, Seychel.; *Agrypnus insularis* Seychelles [Fairm.]. Museum Paris, Collection L. Fairmaire, 1906; Type. 1 ♀, Seychelles, Fallou. *Agrypnus insularis* Fairm. Seychelles; Museum Paris, coll. L. Fairmaire, 1906. 1 ♀, insularis Frm. Seychelles [Fairm.]; Museum Paris, coll. L. Fairmaire, 1906. 1 ♀, Mahe, Fallou; Museum Paris coll. L. Fairmaire 1906. (MNHN, Paris).

The description is based on an unrecorded number of specimens collected in the Seychelles [no detailed locality given] by R. P. Phillibert and submitted by M. G. Fallou. Fleutiaux (1923 : 409) states that the type is in the IRSBNB, Brussels, but as he provides no means of identifying the specimen his statement cannot be accepted as a valid lectotype designation.

The MNHN, Paris contains a number of specimens with a printed locality label: Iles Seychelles, La Digue, Ch. Alluaud, 1892. Several bear Fleutiaux's determination labels; *Agrypnus insularis* Fairm. ex type. However if the specimens were collected by Alluaud in 1892 they cannot have formed part of the original series.

***Lanelater andrewsi* (Candèze)**

*Agrypnus andrewsi* Candèze, 1893a : 169.

*Lanelater andrewsi* (Candèze) Arnett, 1952 : 105.

Holotype. INDIA: ♀, Belgaum S.; 997; *Agrypnus andrewsi* Cand. [Andrewes]; *Agrypnus bipunctatus* Cand.; Andrewes Bequest 1922 : 221 (BMNH).

Andrewes appears to have replaced Candèze's determination label with his own. The synonymy with *bipunctatus* Candèze has not been published. It is probably correct but more specimens of both sexes are required before the synonymy can be confirmed.

***Lanelater arabicus* (Candèze)**

*Agrypnus arabicus* Candèze, 1874 : 6.

*Lanelater arabicus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). ARABIA: ♂, Arabia; Janson coll. 1903.130; *arabicus* type unique [Cand.]; *Agrypnus arabicus* Cdze., type ex Castelnau [Janson] (BMNH).

Candèze did not record the fact that he based the description on a single specimen.

***Lanelater arizonae* (Candèze)**

*Agrypnus arizonae* Candèze, 1897 : 5.

*Lanelater arizonae* (Candèze) Arnett, 1952 : 105.

Holotype. U.S.A.: Arizona, Tucson (*Wickham*) (MCSN, Genoa according to Candèze, loc. cit. Arnett's statement that the type is probably in the Geneva Museum is almost certainly erroneous). Not examined.

The generic attribution is based on a series of specimens (10 ♂, 1 ♀) from Tucson, Arizona (*Bryant*) in the CAS, San Francisco determined by M. C. Lane. The female agrees well with the holotype of *schotti* LeConte and I suspect that examination of the type of *arizonae* will show that the two species are conspecific.

The four (male) specimens (from Globe, Arizona) standing as *arizonae* in the Fall collection (MCZ, Harvard) recorded by Arnett (1952 : 107) are conspecific with the specimens from Tucson. They differ from Arnett's key in that the antennal grooves are not uniformly deep but become more shallow towards the base.

***Lanelater attenuatus* (Candèze)**

*Agrypnus attenuatus* Candèze, 1874 : 4.

*Lanelater attenuatus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). WEST AFRICA: ♂, Niger source [Janson]; Janson coll. 1903.130; *attenuatus* Cdze. [Cand.]; *Agrypnus attenuatus* Cdze, type [Janson] (BMNH).

Paralectotypes. 1 ♀, Niger source [Janson]; Janson coll. 1903.130; *attenuatus*

Cdz. [Cand.]; *Agrypnus attenuatus* Cdze, Cand. [Janson]. 1 ♂, 1 ♀, same data but without Candèze's determination labels (BMNH).

The published locality is 'Guinée [see *Elasmosomus cornutus* (Candèze) p. 103] bouches du Niger.' The discrepancy between the published locality and that on the labels probably arose when Janson relabelled the specimens.

***Lanelater attonitus* (Candèze)**

*Agrypnus attonitus* Candèze, 1874 : 10.

*Lanelater attonitus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). INDIA: ♀, India; Janson coll. 1903.130; *A. attonitus* type [Cand.]; *Agrypnus attonitus* Cdze, type [Janson] (BMNH).

Candèze comments that though labelled 'India' he believes that the species comes from the Malayan peninsula ('presqu'île Hindoue'). As there are no additional records of the species this has not been confirmed.

***Lanelater australis* (Candèze)**

*Agrypnus australis* Candèze, 1874 : 5.

*Lanelater australis* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). BOTSWANA: ♀, Lake N'Gami; Janson coll. 1903.130; *A. australis* Cdz., type L. N'Gami [Cand.]; *Agrypnus australis* Cdze, type ex coll. Castelnau [Janson] (BMNH).

***Lanelater babaulti* (Fleutiaux)**

*Agrypnus babaulti* Fleutiaux, 1918c : 168.

*Lanelater babaulti* (Fleutiaux) Arnett, 1952 : 105.

The original description is based on an unrecorded number of specimens, with a size-range of 26–27 mm, collected by Babault in E. Africa. Three years later Fleutiaux (1921 : 5) published a slightly expanded description of *babaulti* and recorded two specimens collected by Babault in the Kedong Valley.

LECTOTYPE (present designation). KENYA: ♂, Kedong Valley (B.E.A.); G. B. Mars 1913; *Agrypnus babaulti* Fleut., cotype, 1918 [Fleut.]; *infuscatus* Kl. comparé au type, Mus. Berlin [Fleut.] (MNHN, Paris).

Paralectotype. 1 ♂, Kedong Valley (B.E.A.); G. B. Mars, 1913; *Agrypnus babaulti* Fleut., Type, 1918 [Fleut.]; Esp. fig. (MNHN, Paris). Aedeagus missing.

The specimen labelled as the type by Fleutiaux has not been selected as the lectotype because the aedeagus is missing.

The Kedong Valley is about 35 miles east of Nairobi.

Fleutiaux did not publish the synonymy with *infuscatus* Klug. The two species are not synonymous.

***Lanelater badeni* (Candèze)**

*Agrypnus badeni* Candèze, 1889 : 68 (2).

*Lanelater badeni* (Candèze) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens from CAMEROUN, Isulu.

Type-material: ?IRSNB, Brussels.

The confirmation of Arnett's generic attribution is based on the description.

***Lanelater bartoni* (Fleutiaux)**

*Agrypnus bartoni* Fleutiaux, 1902a : 163.

*Lanelater bartoni* (Fleutiaux) Arnett, 1952 : 105.

LECTOTYPE (present designation). ♂, INDIA: *Agrypnus bartoni* Fleut. type [Fleut.] (MNHN, Paris).

Paralectotypes. 2 ex, India. 1 ♂, C. India, Ajmer, Rajputana. These 3 specimens stand beside the lectotype in the Fleutiaux collection but lack determination labels. 1 ♂, T. R. Bell, Karachi; *bartoni* Fleut. [Fleut.] (MNHN, Paris). 1 ♀, T. R. Bell, Karachi, Andrewes Bequest 1922 : 221; *Agrypnus bartoni* Fleut. [Fleut.] (BMNH).

The published locality is 'India' without further details. T. R. D. Bell collected in Kanara in the 1890s and sent the collection to H. E. Andrewes at the end of the century (Kinnear, 1948). The material would therefore have been available to Fleutiaux in 1902 and the inclusion of these specimens in the syntype-series appears justified. There are probably a number of as yet unrecognized paralectotypes in existence as none of those recorded above are 24 mm long, the maximum length recorded by Fleutiaux.

***Lanelater bifoveatus* (Candèze)**

*Agrypnus bifoveatus* Candèze, 1857 : 41.

*Lanelater bifoveatus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). PHILIPPINES: ♂, Dej. Manilla; Janson coll. 1903 : 130; *Agrypnus bifoveatus* Cdze, Cand., type (*A. tomentosus* Dej. Cat.) (e coll. Dejean) [Janson] (BMNH).

Paralectotype: 1 ♂, Dej. Manilla; Janson coll. 1903 : 130; *Agrypnus bifoveatus* Cdze, Cand. v. (*A. tomentosus* Dj. Cat.) (e coll. Dejean) [Janson] (BMNH).

The specimen in the Deyrolle collection bearing this name, to which Candèze refers, has not been found (see p. 274).

***Lanelater bipunctatus* (Candèze)**

*Agrypnus bipunctatus* Candèze, 1857 : 29.

*Lanelater bipunctatus* (Candèze) Arnett, 1957 : 105.

Holotype. ♂ [aedeagus lost]; India bor., de Laf.; Janson coll. 1903 : 130; *A. bipunctatus* [Cand.]; *Agrypnus bipunctatus* Cdze, Cand. type (e coll. de Laferté) [Janson] (BMNH).

The published locality is Sylhet (E. PAKISTAN).

The antennae are malformed. In the left-hand antenna the 5 + 6, 7 + 8 and 9 + 10 segments are fused and in the right-hand antenna the 5 + 6 and 7 + 8 segments are fused.

***Lanelater bradshawi* (Candèze)**

*Agrypnus bradshawi* Candèze, 1889 : 68 (2).

*Lanelater bradshawi* (Candèze) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens from Zambezi found by Bradshaw.

Type-material: ?IRSNB, Brussels.

Candèze records a specimen in the museum of the Société Natura Artis Magistra. This collection is now in the ZM, Amsterdam, but Dr J. P. Duffels tells me that the specimen cannot be found in that collection.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater cinereus* (Candèze)**

*Agrypnus cinereus* Candèze, 1857 : 40.

*Lanelater cinereus* (Candèze) Arnett, 1952 : 105.

The description is based on a single headless specimen from 'des Indes Orientales' in the Deyrolle collection (see p. 271). The specimen has not been located.

The confirmation of Arnett's generic diagnosis is based on material standing as *cinereus* in the BMNH.

***Lanelater confusus* (Fleutiaux)**

*Agrypnus confusus* Fleutiaux, 1935b : 195.

*Lanelater confusus* (Fleutiaux) Arnett, 1952 : 105.

LECTOTYPE (present designation). KENYA: ♀, Kenya, Lokitang, Turkana Nord, 750 m; *Agrypnus confusus* Fleut., type [Fleut.] (MNHN, Paris). Length: 27 mm.

Paralectotype: ♀, same locality as lectotype, labelled 'paratype' but without a determination label (MNHN, Paris). Length: 25 mm.

Fleutiaux records a size-range of 22–27 mm. The smaller specimen or specimens have not been located.

***Lanelater crassiusculus* (Candèze)**

*Agrypnus crassiusculus* Candèze, 1857 : 30.

*Lanelater crassiusculus* (Candèze) Arnett, 1957 : 105.

The description is based on a single specimen from SENEGAL submitted by Mniszech.

Holotype. ?IRSNB, Brussels.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater crassiventris* (Schwarz)**

*Agrypnus crassiventris* Schwarz, 1899 : 75.

*Lanelater crassiventris* (Schwarz) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens with a size-range of 19–21 mm from Deutsch Ost-Africa [TANZANIA] collected by Bennigsen.

Syntypes: ?DEI, Eberswalde.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater dewalquii* (Candèze)**

*Agrypnus dewalquii* Candèze, 1857 : 34.

*Lanelater dewalquii* (Candèze) Arnett, 1957 : 105.

LECTOTYPE (present designation). ANGOLA: ♂, Dey. Benguela; Janson coll. 1903.130; A. dewalquii [Cand.]. *Agrypnus dewalquii* Cdze, Cand., type (e coll. Deyrolle) [Janson] (BMNH).

***Lanelater divergens* (Fairmaire) comb. n.**

*Agrypnus divergens* Fairmaire, 1892 : 101, 80.

Holotype. F.T.A.I. [previously French Somaliland]: ♂, *divergens* Fairm. Obock [Fairm.]; Le Moul't vend; *Agrypnus divergens* Fairm. [IRSNB curatorial label]; R. Mus. Hist. Nat. Belg 1.G.12.595 (IRSNB, Brussels).

The description is based on a single specimen, collected by Dr Gaujon between 3 April, 1890 and 7 April, 1891, and submitted by Maurice Aubert. The above, the only specimen bearing Fairmaire's determination known to me, was presumably acquired by Le Moul't when Aubert's collection was broken up (Horn & Kahle, 1925 : 7).

This species is not listed in the main body of the Schenkling (1925) Catalogue and is assumed to have been overlooked by Arnett (1957). See p. 241.

***Lanelater ereptus* (Candèze)**

*Agrypnus mastersi* var. C., *Agrypnus ereptus* Jans., mss. Candèze, 1874 : 13.

*Lanelater ereptus* (Candèze 1874) Van Zwaluwenburg, 1959 : 349.

Lectotype (designated by Van Zwaluwenburg, 1959 : 349). N.W. AUSTRALIA: ♀, Nicol Bay/N.W. Australia; Janson coll. 1903.130; *Agrypnus ereptus* mihi

[Janson]; Specimen communicated to Candèze and returned as 'Agryp. Mastersii Mc.L. var. C. A. ereptus Jans. Mss' [Janson] (BMNH).

The name *ereptus*, which was first published in synonymy (see above), was made available by Van Zwaluwenburg's treatment of it as an available name with its original authorship and date, and his adoption of it as the name of a taxon (IRZN, Article 11(d), 1963 emendation).

***Lanelater fallaciosus* (Fairmaire) comb. n.**

*Agrypnus fallaciosus* Fairmaire, 1892 : 101.

LECTOTYPE (present designation). F.T.A.I. [previously French Somaliland]: ♀, Obock (Aubert); *fallaciosus* Fairm. n.sp. [Fairm.] (MNHN, Paris).

Paralectotype: 1 ♀, Obock; *fallaciosus* Frm. type [Fairm, date illegible]; Museum Paris. Coll. Abeille de Perrin (MNHN, Paris).

The species was described (loc. cit.: 80) as 'assez commun' but only the above two specimens have been located.

This species is not listed in the main body of the Schenkling (1925) catalogue and is assumed to have been overlooked by Arnett (1957). See p. 241.

***Lanelater fleutiauxi* nom. n.**

*Agrypnus ereptus* Fleutiaux, 1902a : 165. [Junior primary homonym of *Agrypnus ereptus* Candèze, 1874 : 13.]

*Lanelater ereptus* (Fleutiaux) Arnett, 1952 : 105.

LECTOTYPE (present designation). AUSTRALIA: ♀, Australie; Sud. Austr.; *A. ereptus* Jans. in litt. [Cand.] Candèze det. [Fleut.]; *A. ereptus* Fleut., type [Fleut.]; *ereptus* Fleut., Bull. Soc. Ent. Fr. 1902 p. 164 [Fleut.] (MNHN, Paris).

Van Zwaluwenburg (1959 : 349) comments that Fleutiaux's description does not agree with the lectotype of *ereptus* Candèze. The explanation is that although Fleutiaux refers to *A. mastersi* var. *c* Candèze = *ereptus* Jans. in litt.' he based his description not on Candèze's specimen from Nicol Bay, N.W. Australia (see p. 247) but on a specimen from an unknown locality in S. Australia in his own collection. The two specimens are not conspecific.

***Lanelater funestus* (Candèze) comb. n.**

*Agrypnus funestus* Candèze, 1857 : 35.

*Agrypnus funestus* Candèze; Fleutiaux, 1926 : 93. [Restored to specific status. Not a synonym of *aequalis* Candèze.]

The description is based on an unrecorded number of specimens from 'Des Indes Orientales' (see p. 271). There are no specimens from this locality with Candèze's determination label in the BMNH or IRSNB, Brussels.

The interpretation of the species is based on the following specimen, the only one with Candèze's determination label known to me: 1 ♂, Deyr. India; Janson

coll. 1903.130; *A. funestus* [Cand.]; *Agrypnus funestus* Cdze, Cand. e coll. Deyrolle [Janson] (BMNH). The specimen which may be a syntype, is not conspecific with *A. moestus* Candèze and *gilvus* Candèze as recorded by Fleutiaux (1926 : 93).

***Lanelater fuscipes* (Fabricius)**

*Elater fuscipes* Fabricius, 1775 : 211.

*Agrypnus fuscipes* (Fabricius) Germar, 1840 : 253.

*Lanelater fuscipes* (Fabricius) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens from 'India orientali Koenig'. Koenig collected at Tranquebar in Southern India (Zimsen, 1964 : 12). The two specimens in the UZM, Copenhagen, recorded by Zimsen (1964 : 158), may be syntypes.

The generic attribution is based on material standing over this name in the BMNH and MNHN, Paris.

***Lanelater fusiformis* (Candèze)**

*Agrypnus fusiformis* Candèze, 1857 : 39.

*Lanelater fusiformis* (Candèze) Arnett, 1952 : 105.

Holotype. CHINA: Chine meridionale, Mniszech collection from Buquet. The material is in the IRSNB, Brussels according to Fleutiaux (1947 : 290). Not examined.

The confirmation of Arnett's generic attribution is based on the description.

***Lanelater gestroi* (Candèze)**

*Agrypnus gestroi* Candèze, 1880 : 188.

*Lanelater gestroi* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Binaghi, 1941b : 88). NEW GUINEA: ♂, Nuova Guinea, Fly River 1876-77, legit L. M. D'Albertis (CMSN, Milan). Not examined.

The description is based on an unrecorded number of specimens. Binaghi records only one specimen. He does not state whether it bears Candèze's determination label.

The confirmation of Arnett's generic diagnosis is based on the description.

***Lanelater grandis* (Hope)**

*Agrypnus grandis* Hope, 1842 : 428.

*Lanelater grandis* (Hope) Van Zwaluwenburg, 1959 : 350.

Lectotype (designated by Van Zwaluwenburg, 1959). AUSTRALIA: ♀, *grandis* Hope, Pt. Ess. [Hope] (UM, Oxford).

*Lanelater gutturosus* (Fairmaire)

*Agrypnus gutturosus* Fairmaire, 1884c : CXXIII.

*Lanelater gutturosus* (Fairmaire) Arnett, 1952 : 105.

LECTOTYPE (present designation). SOMALI REPUBLIC: ♀, Museum Paris, Somali, Revoil 1883 [printed]; type; *Agrypnus gutturosus* n.sp. [Fairm.]; *Agrypnus gutturosus* Fairm., type [Fleut.] (MNHN, Paris).

The description is based on an unrecorded number of specimens from Makidischu [probably Mogadisco]. The specimen also bears a small label with an illegible number which may correspond to an untraced list of localities. The printed locality label was probably affixed as a matter of curatorial routine.

*Lanelater hageni* (Candèze)

*Agrypnus hageni* Candèze, 1887a : 189.

*Lanelater hageni* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Van Zwaluwenburg, 1959 : 350). SUMATRA: ♀, Dr B. Hagen, Tandjong Morawa, Serdang (N. O. Sumatra); 1; *A. Hageni* Cdz. n.sp. [Cand.] (RNH, Leiden).

Paralectotype. ♀, locality as lectotype, without Candèze's determination label. Numbered '2' by van Zwaluwenburg (RNH, Leiden).

The description is based on two specimens. The specimens numbered 3 (♂, H. M. Pantekok Bekri, Dali) and 4 (♀, J. D. Pasteur, Insula Nias) by van Zwaluwenburg (1959 : 350) are not part of the syntype series.

*Lanelater infuscatus* (Klug)

*Agrypnus infuscatus* Klug, 1855 : 67.

*Agrypnus antennatus* Candèze, 1893 : 5. [Synonymized by Schwarz, 1906 : 8.]

*Lanelater infuscatus* (Klug) Arnett, 1952 : 105.

*Agrypnus infuscatus* Klug. LECTOTYPE (present designation). MOZAMBIQUE: ♂, Tette, Peters Nr. 16047; *infuscatus* Klug, Cand. Tette, Peters [Gerstaecker] (NMHU, Berlin). Length 19.5 mm.

The number 16047 refers to a museum catalogue recording the locality and collector. The absence of Klug's label is probably due to Gerstaecker (see p. 275).

Klug recorded the size range of this species as  $8\frac{1}{2}$ – $9\frac{1}{2}$  [presumably German] lines (=18.6–20.8 mm). The NMHU, Berlin collection contains two specimens with the same locality labels as the lectotype measuring 24 mm in length. The discrepancy in length is too great to allow these specimens to be accepted as part of the original syntype series. They are conspecific with the lectotype.

*Agrypnus antennatus* Candèze. LECTOTYPE (present designation). SOUTH AFRICA: ♂, n.sp. *antennatus* Cand., Natal, Per. [Cand., blue border]; *A. antennatus*; *Agrypnus antennatus* Cand., det. E. Candèze [IRSNB curatorial label] (IRSNB, Brussels).

*Lanelater javanus* (Candèze)*Agrypnus javanus* Candèze, 1857 : 44.*Lanelater javanus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). JAVA: ♀, Dej. Java; Janson coll. 1963.130; *A. javanus* [Cand.] *Agrypnus javanus* (Dej. Cat.) Cdze, Cand. type (e coll. Dejean) [Janson] (BMNH).

Paralectotype. ♀, Dej. Java; Janson coll. 1903.130; *Agrypnus javanus* (Dej. Cat.) Cdze, Cand. (e coll. Dejean) [Janson] (BMNH).

*Lanelater judaicus* (Reiche & Saulcy)*Agrypnus judaicus* Reiche & Saulcy, 1857 : 418; pl. 12, fig. 11.*Lanelater judaicus* (Reiche & Saulcy) Arnett, 1952 : 105.

The description is based on material collected by Sauley at Jerusalem with the comment 'J'en ai vu un individu de Bayrouth et un autre de Saida'.

Neither of these specimens has been traced.

Confirmation of Arnett's generic attribution is based on the description.

*Lanelater labeculatus* (Candèze)*Agrypnus labeculatus* Candèze, 1892a : 795.*Lanelater labeculatus* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Binaghi, 1941b : 87). ENGGANO: Kifu-juc (CMSN, Milan). Not examined.

Paralectotypes: 2 ex, Bua-Bua (CMSN, Milan). Not examined. ? ♀, Engano, Kifu-juc, v. Modigliani 1891; *Agrypnus labeculatus* Cand. n.sp. [?Cand.]; ex type, Gestro det. [Fleut.]. ? ♂, Engano, Bua-Bua, Modigliani 1891; *Agrypnus labeculatus* Cand. [Cand.] (MNHN, Paris). The contents of the abdomen of each of the Paris specimens has been eaten by *Anthrenus*.

The description is based on an unrecorded number of specimens ('plusieurs individus') collected on Enggano at Bua-Bua and Kifu-juc in May and June 1891 by Modigliani and submitted to Candèze by Gestro. Binaghi does not record the presence of Candèze's determination label. The IRSNB, Brussels may possess additional paralectotypes. The island of Enggano (or Engano) lies about 70 miles off the west coast of southern Sumatra.

*Lanelater lacertosus* (Candèze)*Agrypnus lacertosus* Candèze, 1857 : 38; pl. 1, fig. 1.*Lanelater lacertosus* (Candèze) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens with a size-range of 30–40 mm from Silhet [=Sylhet, E. PAKISTAN].

Syntype-material: not found in BMNH. ?IRSNB, Brussels.

Confirmation of Arnett's generic attribution is based on specimens standing as *lacertosus* in the BMNH.

***Lanelater laosensis* Ohira**

*Lanelater laosensis* Ohira, 1970b : 232; pl. VI, fig. C, pl. VII, fig. F.

Holotype. ♂, LAOS (TM, Budapest). Not examined.

Paratype. ♀, Laos (TM, Budapest or Entomological laboratory, Aichi University, Japan). Not examined.

***Lanelater laticollis* (Hope) comb. n.**

*Agrypnus laticollis* Hope, 1843 : 366.

*Agrypnus caliginosus* Candèze, 1857 : 28. [Confirmation of Candèze's (1857 : 28) provisional synonymy.]

*Lanelater caliginosus* (Candèze) Arnett, 1952 : 105.

*Agrypnus laticollis* Hope. LECTOTYPE (present designation). W. AFRICA: ♂, *laticollis* Hope Palmas [Hope]; Type, Hope, Ann. Nat. Hist. II. 1843 p. 366. Coll. Hope Oxon; Type coll. 1545, *Agrypnus laticollis* Hope. Hope Dept, Oxford (UM, Oxford).

*Agrypnus caliginosus* Candèze. LECTOTYPE (present designation). SENEGAL: ♂, Senegal Dej.; Janson coll. 1903.130; *A. caliginosus* [Cand.]; *Agrypnus caliginosus* (Buq.) Cdze, Cand. type (*A. senegalensis* var. Dej. Cat. e coll. Dejean) [Janson] (BMNH).

The absence of Dejean's label is probably due to Janson (see p. 276). The specimen is 38 mm long compared with the published length of 40 mm.

Schenkling (1925 : 7) records *laticollis* as a synonym of *caliginosus*. The Hope name has priority.

***Lanelater latior* (MacLeay) sp. rev., comb. n.**

*Agrypnus latior* MacLeay, 1872 : 250.

The description is based on an unrecorded number of specimens collected by Masters at Gayndah [AUSTRALIA, Queensland]. Neboiss (1956 : 3) states that the type is in the AM, Sydney but since he does not record the data or otherwise identify the specimen, this cannot be accepted as a valid lectotype designation.

Candèze (1874 : 13) synonymized this species with *mastersi* MacLeay. Neboiss (1953 : 3) accepted the synonymy. The reason for treating *latior* as a valid species is discussed under *mastersi* on p. 255.

The generic attribution is based on the description.

***Lanelater longicollis* (Candèze)**

*Agrypnus longicollis* Candèze, 1889 : 63 (3).

*Lanelater longicollis* (Candèze) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens from ABYSSINIA.

Type-material: ?IRSNB, Brussels.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater longicornis* (Gahan) comb. n.**

*Agrypnus longicornis* Gahan, 1900 : 26; pl. 1, fig. 11.

Holotype. SOMALI REPUBLIC: ♂, Cent. and East Somaliland. Capt. June 5–October 29. 1897 and pres. 1897 by C. V. A. Peel; *Agrypnus longicornis* Gahan. Type [Gahan]; 1900.128 [=presented by Prof. E. B. Poulton, Oxford] (BMNH).

The published locality is Central or East Somaliland.

This species is not listed in the main part of the Schenkling (1925) Catalogue and is assumed to have been overlooked by Arnett (1952). See p. 241.

***Lanelater lopezei* (Fleutiaux)**

*Agrypnus lopezei* Fleutiaux, 1934c : 477.

*Lanelater lopezei* (Fleutiaux) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens in the collections of the author and the Hawaiian Sugar Planters' Experimental Station, Hawaii.

Syntype examined. PHILIPPINES: ♂, Diklom, Bukidnon, Mindanao P. I. 2000 ft, 3.26.32 [altitude altered from 3000 ft and date added in manuscript]. F. C. Haddon collection; *Agrypnus lopezei* Fleut. type [Fleut.]. 1 ♂, same locality but with the printed altitude 3000 ft (MNHN, Paris).

***Lanelater luridus* (Fabricius)**

*Elatér luridus* Fabricius, 1781 : 265.

*Agrypnus punctatus* Candèze, 1857 : 26. **Syn. n.**

*Agrypnus sondaicus* Candèze, 1857 : 33. **Syn. n.**

*Agrypnus moestus* Candèze, 1857 : 34. **Syn. n.**

*Agrypnus gilvus* Candèze, 1865 : 5. **Syn. n.**

*Lanelater luridus* (Fabricius) Arnett, 1952 : 105.

*Elatér luridus* Fabricius. LECTOTYPE (present designation). ♂, *Elat. luridus* Fabr. sp. Ins. n. 3 [unidentified handwriting] (BMNH, Banks collection).

Paralectotype: ♀, head and prothorax lost, no labels (BMNH, Banks collection).

The published locality is Coromandel [INDIA]. The paralectotype does not agree with the females of the BMNH *luridus* series and probably belongs to a different species.

*Agrypnus punctatus* Candèze. LECTOTYPE (present designation). JAVA: ♀, Java; Janson coll. 1903.130; *Agrypnus punctatus* Cand., Cand., type (e coll. Laferté); D. Hope (BMNH).

Paralectotype: ♂, Deyr.; Janson coll. 1903.130; *Agrypnus punctatus* Cdze, Cand. (e coll. Dyrolle) [Janson]; D. Hope (BMNH).

The absence of Candèze's determination label is probably due to Janson (see p. 276). Not a synonym of *aequalis* as stated by Fleutiaux (1889 : 138).

*Agrypnus sondaicus* Candèze. Holotype. JAVA: ♀, Dej. Java; Janson coll. 1903.130; sondaicus [Cand.]. *Agrypnus sondaicus* (Dej. cat.) Cdze, Cand. type (e coll. Dejean) [Janson] (BMNH).

Not a synonym of *aequalis* as stated by Fleutiaux (1923 : 409).

*Agrypnus moestus* Candèze. LECTOTYPE (present designation). INDIA: ♂, Dej. India; Janson coll. 1903.130; *Agrypnus moestus* Cdze. *A. socius* Dej. coll. (e coll. Dejean) [Janson] (BMNH). Length: 25 mm.

The description is based on an unrecorded number of specimens from 'Des Indes Orientales' (see p. 271). Candèze lists *Agrypnus socius* Dej. Coll. [nomen nudum] as a synonym. Despite the absence of Candèze's determination label I believe that this specimen formed part of the series on which he based his description. The absence of Candèze's determination label and the discrepancy between the published locality and that on the label are probably due to Janson (see p. 276).

*L. moestus* (Candèze) is not conspecific with *L. aequalis* (Candèze) as recorded by Fleutiaux (1889 : 138) nor is the synonymy (Fleutiaux, 1926 : 93) with *L. funestus* (Candèze) correct.

Fleutiaux (1935 : 194) records *luridus* from Ethiopia, Bourillé, Kenya, Lokitang and also Arabia, Somaliland, Abyssinia, Uganda and Tanganyika. The MNHN, Paris contains the following specimens standing as *luridus* in the collection: 2 ♂, 7 ♀ Bourie [sic, see p. 260], 1 ♂, Lokitang, 1 ♂, Abyssinie, Harar, 1 ♂, Unguru D.O.A. [=Tanganyika]. None of these specimens is conspecific with the type of *luridus* and all belong to an unnamed African species. It seems probable that *luridus* does not occur in Africa and that the distribution of this species is limited to India and Ceylon.

*Agrypnus gilvus* Candèze. The description is based on an unrecorded number of specimens from SIAM and CAMBODIA received from de Castelnau.

Type-material: not found in the BMNH or the IRSNB, Brussels or Castelnau collection, NMV, Melbourne. Interpretation of the species is based on the following specimen. ♂, Malacca; Janson coll. 1903 : 130; *Agrypnus gilvus* Cdz. Malacca [Cand.]; *moestus* [Cand.] 1874 [Janson] *Agrypnus gilvus* 1864, *A. moestus* Cdze. 1874 ex coll. Candèze [Janson] (BMNH). This is the only specimen with Candèze's determination label known to me. Not a synonym of *aequalis* as stated by Candèze (1874 : 10).

### *Lanelater maculicollis* (Gerstaecker)

*Agrypnus maculicollis* Gerstaecker, 1871 : 53.

*Lanelater maculicollis* (Gerstaecker) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens with a size-range of 22–25 mm from ZANZIBAR collected by van der Decken. Candèze

(1874 : 7) records that the type is in the ZMHU, Berlin (not confirmed). Interpretation of the species is based on the three specimens (2 ♀, 1 ♂) from MOZAMBIQUE recorded by Candèze (1874 : 7) in the BMNH.

***Lanelater mastersi* (MacLeay)**

*Agrypnus mastersi* Macleay, 1872 : 249.

*Lanelater mastersi* (Macleay) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens collected by Masters at Gayndah [AUSTRALIA, Queensland]. Neboiss (1956 : 3) records that the type is in the AM, Sydney, but since he does not record data or otherwise identify the specimen this statement cannot be accepted as a valid lectotype designation.

Candèze (1874 : 13) believed *mastersi* to be a very variable species and regarded *A. latior* MacLeay as a synonym. Neboiss (1953 : 3) accepted the synonymy. However, since the specimens standing as *mastersi* in the BMNH belong to a number of different species, suggesting that *mastersi* is not as variable as Candèze supposed, I consider it prudent to treat *latior* MacLeay as a distinct species until the lectotypes of the two species have been designated and compared.

***Lanelater modestus* (Schwarz)**

*Agrypnus modestus* Schwarz, 1902f : 305.

*Lanelater modestus* (Schwarz) Arnett, 1952 : 105.

Holotype. LESSER SUNDA ISLANDS: Sex unknown, Sumbawa (*Moser*) ?DEI, Eberswalde.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater moseri* (Schwarz)**

*Agrypnus moseri* Schwarz, 1903a : 357.

*Lanelater moseri* (Schwarz) Arnett, 1952 : 105.

Syntypes: TANZANIA: 2 ex., Deutsch Ostafrika (*Moser*). ? DEI, Eberswalde.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater mucronatus* (Candèze)**

*Agrypnus mucronatus* Candèze, 1857 : 42.

*Agrypnus mucronatus* var. *incisus* Fleutiaux, 1927 : 59.

*Lanelater mucronatus* (Candèze) Arnett, 1952 : 105.

Holotype. BORNEO: ♂, *mucronatus* Cdz. Borneo [Candèze, yellow border]; *Agrypnus mucronatus* Cand. det. E. Candèze [IRSNB curatorial label]; Collection E. Candèze (IRSNB, Brussels).

*A. mucronatus* var *incisus* Fleutiaux. Material examined: 1 ♀, Luang Prabang, Environs. Vitalis de Salvaza; Bou Nam Mo, Luang Prab. 3.3.18 *mucronatus* Cand. v. *incisus* Fleut. [Fleut.] (MNHN, Paris).

***Lanelater nitidus* (Fleutiaux)**

*Agrypnus nitidus* Fleutiaux, 1918c : 167.

*Lanelater nitidus* (Fleutiaux) Arnett, 1952 : 105.

LECTOTYPE (present designation). KENYA: ♀, Kedong Valley, B.E.A., G.B. Mars 1913; *Agrypnus nitidus* Fleut., type [Fleut.] (MNHN, Paris). The Kedong Valley is about 35 miles east of Nairobi.

***Lanelater notodonta* (Latreille)**

*Elater notodonta* Latreille, 1827 : 275; pl. 58, fig. 6.

*Agrypnus notodonta* (Latreille) Germar, 1840 : 253.

*Amaurus senegalensis* Castelnau, 1840 : 237. [Synonymized by Candèze, 1857 : 27.]

*Agrypnus himerensis* Ragusa, 1881 : 8; pl. 1, figs 7 & 8.

*Agrypnus notodonta* var. *himerensis* Ragusa, Ragusa, 1911 : 196.

*Agrypnus notodonta* ssp. *imerensis* Binaghi, 1941a : 72. [Unjustified emendation.]

*Lanelater notodonta* (Latreille) Arnett, 1952 : 105.

*Elater notodonta* Latreille. The description is based on an unrecorded number of specimens from Sennar [SUDAN] collected by Caillaud in the course of his expedition to Meroë. There are no specimens from the Latreille collection in the BMNH. The location of the Caillaud collection is unknown.

Interpretation of the species is based on the following specimen: EGYPT: ♀, Egypt; Janson coll. 1903.130; *Agrypnus notodonta* Latr, Egypte [Cand.]; *Agrypnus notodonta* Latr. Cdze. ex coll. Candèze [Janson] (BMNH). Examination of the available material standing as *notodonta* in the BMNH, IRSNB, Brussels and MNHN, Paris has shown that there is no disagreement concerning the identity of this species.

*Amaurus senegalensis* Castelnau. The description is based on an unrecorded number of specimens from SENEGAL. The material cannot be found in the IRSNB, Brussels. The interpretation of the species is based on the following specimens: 2 ♀ on one cork mount, *notodonta* (Senegal) (NMV, Melbourne, Castelnau collection). These specimens may be the ones on which Castelnau based his description and which have been relabelled at a later date. They agree well with the description and measure 28.5 mm and 28 mm in length and 9 mm and 8 mm in width compared with the published measurements of 14 lines [= 31.5 mm (French lines) or 29.6 mm (English lines)] and 4 lines [= 9 mm or 8.4 mm].

*Agrypnus himerensis* Ragusa. The description is based on an unrecorded number of specimens collected in SICILY, Termini Imerensi in August and September. Ragusa first saw the species standing as *Agryphus conspersus* Dej. in the Baldassare Romano collection [not located by the present writer] in 1870 and again in the

collection of Prof. Ciafalo from whom he received six specimens. The Ragusa collection was broken up (Horn & Kahle, 1936 : 218) and it is therefore possible that the following specimens are part of the original syntype-series.

Material examined; 1 ♂, *himerensis* Rag. Sicil.; Museum Paris, Collection Leon Fairmaire 1906. 1 ♀, Type, Sicile, Ragusa; Museum Paris, Coll. L. Bedel 1922; *himerensis* Rag. 1 ♀, Sicile, Termini, E. Ragusa; Termini; *Agrypnus himerensis*; *himerensis* Rag. [Fleut] (MNHN, Paris). The handwriting on the determination labels is unknown and appears to be different in each case.

Schenkling (1925 : 4) records the following species as a synonym of *notodonta* Latreille.

*Elater fuscipes* Olivier, 1790; no. 31, p. 20; pl. 3, fig. 21. The description is based on an unrecorded number of specimens from 'Cap de Bonne-Esperance' S. Africa. Fleutiaux (1911 : 475) synonymized *fuscipes* with *notodonta*, commenting that Olivier's type is in his collection. However the male in the Fleutiaux collection in the MNHN, Paris labelled '*fuscipes* Ol. non Fab., type d'Olivier' by Fleutiaux bears the locality SENEGAL. It is *notodonta* Latreille. *L. notodonta* has not been recorded from S. Africa. *Agrypnus antennatus* Candèze (= *L. infuscatus* (Klug)), and *L. peringueyi* Candèze are the only *Lanelater* species recorded from S. Africa.

### ***Lanelater ocellatus* (Candèze)**

*Agrypnus ocellatus* Candèze, 1857 : 39.

*Lanelater ocellatus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). ♂, Ind. or.; Janson coll. ex Candèze, 1903.130; *Agrypnus ocellatus* Cdz., Ind. or. [Cand.]; *Agrypnus ocellatus* Cand., type. Ex coll. Cand. [Gahan] (BMNH).

The published locality is 'Des Indes Orientales' (see p. 271).

Additional material examined. CEYLON: Colombo, on coast level, 7-27.iv.32 (G. Lewis) 1 ♂, 1 ♀ (BMNH).

### ***Lanelater olcesii* (Fairmaire)**

*Agrypnus olcesii* Fairmaire, 1884a : 446.

*Lanelater olcesii* (Fairmaire) Arnett, 1952 : 105.

LECTOTYPE. MOROCCO: ♀, Mogador; *Agrypnus olcesii* Frm. Mar. [?, illegible] 1884 [Fairm.] Type; Museum Paris, Coll. L. Fairmaire (MNHN, Paris).

### ***Lanelater opacus* (Candèze)**

*Agrypnus opacus* Candèze, 1878 : 8.

*Lanelater opacus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). WEST MALAYSIA: ♂, Malacca; Janson coll. 1903.130; *A. opacus* Cdz., type, Malacca [Cand.]; *Agrypnus opacus* Cdze, type ex coll. Castelnau [Janson] (BMNH).

Paralectotype: ♀, Malacca; Janson coll. 1903.130; *Agrypnus opacus* Cdz, Cand., ex coll. Castelnau [Janson] (BMNH).

***Lanelater pacificus* (Candèze)**

*Agrypnus pacificus* Candèze, 1882 : 1.

*Lanelater pacificus* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Van Zwaluwenburg, 1959 : 350, see p. 9). NEW GUINEA: ♀ Woodlark I. (IRSNB, Brussels). Not examined. Van Zwaluwenburg's comment 'designated by Candèze' presumably indicates that the specimen bears Candèze's determination label with word 'type'.

Candèze did not record this species from New Britain. Therefore the two additional specimens in the IRSNB Brussels to which van Zwaluwenburg refers, cannot be part of Candèze's original series.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater parallelcollis* (Candèze)**

*Agrypnus parallelcollis* Candèze, 1889 : 63 (3).

*Lanelater parallelcollis* (Candèze) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens, with a size-range of 20–30 mm, from Kordofan [SUDAN].

Type-material: ? IRSNB, Brussels.

The generic attribution is based on a male from N. NIGERIA, Anzare, determined by Fleutiaux (BMNH).

***Lanelater peringueyi* (Candèze)**

*Agrypnus peringueyi* Candèze, 1889 : 68 (2).

*Lanelater peringueyi* (Candèze) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens from Cape Town [S. AFRICA] received from Peringuey.

Type-material: ? IRSNB, Brussels.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater permucronatus* (Schwarz)**

*Agrypnus permucronatus* Schwarz, 1902b : 194.

*Lanelater permucronatus* (Schwarz) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens, with a size-range of 28–33 mm, from BORNEO, Kina Balu.

Syntype-series: ? DEI, Eberswalde.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater persicus* (Candèze)**

*Agrypnus persicus* Candèze, 1874 : 6.

*Lanelater persicus* (Candèze) Arnett, 1952 : 105.

Holotype. PERSIA: ♂, 39865 [Fry catalogue number = Persia, Millingen (Higgins)] Persia; Fry coll. 1905.100; *A. persicus* Cdz., type [Cand.]; *Agrypnus persicus* Cand., type ex coll. Fry [Gahan]; *Agrypnus persicus* Cand., type [Fry] (BMNH).

***Lanelater pescadoriensis* (Miwa)**

*Agrypnus pescadoriensis* Miwa, 1934 : 178; pl. 9, fig. 9.

*Lanelater pescadoriensis* (Miwa) Arnett, 1952 : 105

The description is based on an unrecorded number of specimens from Hokoto (Pescadores), V. 1932 (*T. Chin*).

Type-material: ?Taiwan Agricultural Research Institute, Taipei.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater politus* (Candèze)**

*Agrypnus politus* Candèze, 1857 : 43.

*Lanelater politus* (Candèze) Arnett, 1952 : 105.

Holotype. CHINA: ♀, Gory, China; Janson coll. 1903.130; *politus* Gory China [? Gory]; *A. politus* [Cand.]; *Agrypnus politus* (Gory) Cdz., Cand., type (e coll. de Laferté) [Janson] (BMNH).

***Lanelater ponderatus* (Candèze)**

*Agrypnus ponderatus* Candèze, 1897 : 5.

*Lanelater ponderatus* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Van Zwaluwenburg, 1959 : 350). PHILIPPINES: ? ♀, n.sp. *ponderatus* Cand. Mindanao St.[audinger] [presumably Cand.] (IRSNB, Brussels).

Paralectotype: second specimen, data not recorded, listed by Van Zwaluwenburg (1959 : 350) (IRSNB, Brussels).

***Lanelater proximus* (Fleutiaux)**

*Agrypnus proximus* Fleutiaux, 1935b : 194.

*Lanelater proximus* (Fleutiaux) Arnett, 1952 : 105.

LECTOTYPE (present designation). ETHIOPIA: ♀, Ethiopia Merid. Bourie [sic] Bord de la Riv. Omo, 600 m; *Agrypnus proximus* Fleut., type, ♂ [Fleut] (MNHN, Paris).

Paralectotype. KENYA: ♀, Bords du lac Rodolphe, Monts Lubur, 570 m; *proximus* Fleut., type ♀ [Fleut] (MNHN, Paris).

The published locality is Bourillé, an area on the west bank of the river Omo, about 40 miles north of the northern end of Lake Rudolph. Bourie is a misprint which occurs on a large number of labels. Fleutiaux was mistaken in the sex of the specimen from Bourillé.

***Lanelater puber* (Candèze)**

*Agrypnus puber* Candèze, 1857 : 30.

*Lanelater puber* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). SENEGAL: ♀, Senegal, Dej.; Janson coll. 1903.130; *puber* [Cand.]; *Agrypnus puber* (Dej. Cat.) Cdze, Cand, type (e coll. Dejean) [Janson] (BMNH).

Paralectotypes. 1 ♀, 2 ♂, Dej. Senegal: Janson coll. 1903.130; *Agrypnus puber* (Dej. Cat.) Cdze, Cand. (e coll. Dejean) [Janson] (BMNH).

*A. tropicus* Hope (1843 : 365), which Candèze tentatively recorded as a synonym, is a *Propsephus* species (see p. 11).

***Lanelater pubescens* (Candèze)**

*Agrypnus pubescens* Candèze, 1857 : 31.

*Agrypnus bocandei* Candèze, 1857 : 32. [Reduced to a variety of *pubescens* Candèze, Candèze, 1874 : 4.]

*Lanelater pubescens* (Candèze) Arnett, 1952 : 105.

*Agrypnus pubescens* Candèze. LECTOTYPE (present designation). SENEGAL: ♀, Senegal; Janson coll. 1903.130; *A. pubescens* Cdz. 1 (p. 31) [Cand.]; *Agrypnus pubescens* Cand. v. [Janson] (BMNH).

Candèze mentions both sexes in his description, but no male syntypes have been located. The lectotype agrees with the description but measures 20 mm in length compared with the published measurements of 25 mm. As there is a similar discrepancy in the case of *bocandi* it has been assumed that Candèze made a 5 mm error when measuring these specimens.

*Agrypnus bocandei* Candèze. LECTOTYPE (present designation). SENEGAL: ♂, Senegal, Dej.; *bocandei* [Cand.]; *Agrypnus bocandei* (Dej. coll.) Cdze, Cand., type (e coll. Dejean) [Janson] (BMNH).

The specimen measures 17.2 mm in length compared with the published length of 12 mm. This discrepancy is discussed above. Fleutiaux (1935b : 195) considered that *bocandei* should be regarded as a good species. Comparison of the lectotypes has shown that this belief is not justified.

***Lanelater pumilus* (Candèze)**

*Agrypnus pumilus* Candèze, 1889 : 69 (3).

*Lanelater pumilus* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Binaghi, 1941b : 89). ETHIOPIA: Assab, IV, 1888, legit Ragazzi. (CMSN, Genoa). Not examined.

The description is based on an unrecorded number of specimens in the MCSN, Genoa. Binaghi records only one specimen. He does not state whether it bears Candèze's determination label.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater renardi* (Candèze)**

*Agrypnus renardi* Candèze, 1890 : CXLVIII.

*Lanelater renardi* (Candèze) Arnett, 1952 : 105.

The description is based on 1 ex. from Tetara and 2 ex. from Konbir [INDIA] collected by Cardon (see p. 273).

Syntypes: ? IRSNB, Brussels.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater resectus* (Candèze)**

*Agrypnus resectus* Candèze, 1857 : 45.

*Lanelater resectus* (Candèze) Arnett, 1952 : 105.

The description is based on a single specimen from Nouvelle Hollande [AUSTRALIA] bearing the name *Agrypnus australasiae* Dup. in the Mniszech collection.

Holotype: IRSNB, Brussels according to Neboiss (1961 : 5). Not confirmed.

Confirmation of Arnett's generic attribution is based on specimens standing as *resectus* in the BMNH.

***Lanelater robustus* (Fleutiaux)**

*Agrypnus robustus* Fleutiaux, 1902a : 163.

*Lanelater robustus* (Fleutiaux) Arnett, 1952 : 105.

LECTOTYPE (present designation). JAVA: ♂, Java, *Agrypnus robustus* Fleut., type [Fleut.] (MNHN, Paris).

Paralectotypes. 1 ex., Java. 6 ♂, 5 ♀, Java occident. Pengalengen, 4000, 1893. H. Fruhstorfer. One specimen bears Fleutiaux's determination label. 1 ♂, 1 ♀, Palaboean, Java, S.O. 1 ♂, 3 ♀, Soekaboemi, Java, Rouyer (MNHN, Paris). These 18 specimens stood beside Fleutiaux's type-specimen in the Fleutiaux collection. Since they fall within the published size-range of 38–45 mm, it seems safe to assume that Fleutiaux had them before him at the time of the description.

***Lanelater rubiginosus* (Candèze)**

*Agrypnus rubiginosus* Candèze, 1865 : 5.

*Lanelater rubiginosus* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Van Zwaluwenburg, 1959 : 351). SUMATRA: ♀, Müller,

Sumatra, presumably with Candèze's determination label (RNH, Leiden). Not examined.

Since Van Zwaluwenburg does not record the data on the second specimen it is impossible to determine whether it formed part of the syntype-series.

Confirmation of Arnett's generic attribution is based on the description.

### *Lanelater rufipes* (Candèze)

*Agrypnus rufipes* Candèze, 1874 : 7.

*Lanelater rufipes* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). INDIA: ♀, Pondicherty; Janson coll. 1903. 130; *A. rufipes* Cdz. n.sp. [Cand.]; *Agrypnus rufipes* Cdz., type [Janson] (BMNH).

### *Lanelater rufus* (Candèze)

*Agrypnus rufus* Candèze, 1857 : 32.

*Lanelater rufus* (Candèze) Arnett, 1952 : 105.

LECTOTYPE (present designation). ♀, type; Cayenne, typ.; Collection Chevrolat; *rufus* Cand., type mon. [Fleut.]. The specimen stands over a green Chevrolat label: *Agrypnus rufus* (Chev.) Candèze type. Mon. 1, p. 32. 13. Cayenne, Coll. Chevrolat (MNHN, Paris).

The published locality is 'Guyane' but Candèze (1874 : 6) states that this is erroneous and that *rufus* is an African species. It has been recorded as an African species in subsequent catalogues (Candèze, 1891 : 10, Schenkling, 1925 : 7) but there are no published records of its capture in Africa.

### *Lanelater sallei* (LeConte)

*Agrypnus sallei* LeConte, 1853 : 491.

*Lanelater sallei* (LeConte) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens with a size-range of 0.85–1.10 [inches = 21.7–28.2 mm.] collected near New Orleans [U.S.A., Louisiana] by Sallé and given to LeConte by Guex and specimens subsequently collected by Schott at Eagle Pass [Texas] on the Lower Rio Grande.

LECTOTYPE (present designation). U.S.A.: ♂, brick red paper disk [Southern States, see p. 277]; Type, 2373 [MCZ curatorial label]; *Agrypnus sallei* Lec. [LeC.] (MCZ, Harvard). Length: 24.8 mm.

Paralectotypes: 1 ♂, dark red paper disk [Texas, see p. 277]; *sallei* 3 [MCZ curatorial label]. Length: 21.8 mm. 1 ♂, dark red paper disk [Texas]; *sallei* 4 [MCZ curatorial label]. Length: 27.7 mm. (MCZ, Harvard). It is by no means certain that these two specimens were in fact collected by Schott at Eagle Pass but since they are the only specimens from Texas in the LeConte collection there is no alternative but to accept them as part of LeConte's syntype series. The two

paralectotypes are not conspecific with one another. The one labeled 'sallei 3' belongs to a species unknown to me. It is conspecific with two males from Brewster county, Texas in the CAS, San Francisco collection. The specimen marked 'sallei 4' differs from the lectotype in that the antennae do not attain the posterior angles of the prothorax, falling short of it by the length of more than one segment. In addition the lateral lobes of the aedeagus are stouter than those of the lectotype. The specimen is conspecific with the males of series from Falfurrias, Texas, Green [Greer] Co., Oklahoma and Medora, Kansas. Further studies are required before it can be decided whether these specimens belong to a distinct species or whether they are a form of *sallei*.

Additional material examined. U.S.A., Louisiana: New Orleans, 1 ♀ (BMNH). Florida: Dunedin, 2 ♂; Enterprise, 3 ♀; Hillsbro, 1 ♂, 1 ♀; Jacksonville, 1 ♀; Lake Placid, 1 ♂; Naples, 1 ♂; St. Augustine, 1 ♂; Stuart, 1 ♂ (CAS, San Francisco.) I have not seen any specimens of *sallei* from localities west of New Orleans.

The specimen labelled 'sallei 2' (♂, grey-green paper disk [faded dark green = New Mexico, see p. 277] which is conspecific with specimens from Tucson believed to be *arizonae* Candèze), and 'Sallei 5' (♂, Fla., correctly identified) standing with the syntypes in the LeConte collection (MCZ, Harvard) are obviously not part of the syntype series.

### *Lanelater schotti* (LeConte)

*Agrypnus schotti* LeConte, 1853 : 492.

*Lanelater schotti* (LeConte) Arnett, 1952 : 105.

Holotype. U.S.A.: ♀, dark red paper disk [Texas, see p. 277]; Type 2374 [MCZ curatorial label] (MCZ, Harvard). The published locality is Lower Rio Grande, the river which forms the boundary between Texas and Mexico.

The LeConte collection (MCN, Harvard) also contains the following specimens: 1 ♀, illegible locality, 25; *schotti* 2 [MCZ curatorial label]. 1 ♀, Ariz.; *schotti* 3 [MCZ curatorial label]. These specimens, which are presumably those recorded by Arnett (1952 : 106), differ from his description in that the antennal grooves do not have abrupt ends but become shallow at the base. In spite of the fact that these two specimens have a more robust appearance, I believe that they are conspecific with the holotype.

### *Lanelater scortecci* (Binaghi) comb. n.

*Agrypnus scortecci* Binaghi, 1941a : 73; fig. 8.

*Lanelater scortecci* (Binaghi) Arnett, 1952 : 105.

Holotype and paratype. LIBYA: Fezzan; Gat estate, 1934, light, G. Garganese (MCSN, Milan) and another paratype, same data in Binaghi collection. Not examined.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater semicribrosus* (Fairmaire) sp. rev., comb. n.**

*Corymbites semicribrosus* Fairmaire, 1887 : 153.

*Agrypnus semicribrosus* (Fairmaire) Candèze, 1896 : 6.

*Agrypnus candezei* Fleutiaux, 1919 : 8. **Syn. n.**

*Corymbites semicribrosus* Fairmaire. LECTOTYPE (present designation). SOMALI: ♂, Museum Paris, Somali, Revoil, 1885 [printed]; 490; [mss.]; *Corymbites semicribrosus* Frm. [Fairm.]; Fairm. det. [Fleut.] (MNHN, Paris).

The published locality is Zanzibar. Fairmaire based his description on material collected by Revoil during his expeditions to 'les Somalis et dans l'intérieur du Zanguebar [see p. 44]. It seems probable that the printed label was attached to all the material collected on these expeditions, and that the number 420 refers to a more detailed list of localities whose present whereabouts is unknown.

*Corymbites semicribrosus* Fairmaire is not conspecific with *Agrypnus infuscatus* Klug (see p. 250) as stated by Schwarz (1906 : 8).

*Agrypnus candezei* Fleutiaux. Holotype. TANZANIA: ♀, Mandra, Zanguebar; *Agrypnus candezei* Fleut., type [Fleut.]; ♀ du précéd. *semicribrosus*, Cand. det. [Fleut.] (MNHN, Paris). The specimen has a broader, stouter appearance and shorter, less strongly serrate antennae than most other female *Lanelater* species known to me.

This synonymy is based on the belief that *semicribrosus*, of which the lectotype resembles the males of a series of an undescribed species from Chiromo (Malawi) in the BMNH, also resembles the undescribed species in that the females have a broader, stouter appearance, and shorter, less strongly serrate antennae. This belief is in some measure supported by the fact that a male with the same locality label as the holotype of *candezei* agrees well with the lectotype of *semicribrosus*. Fleutiaux did not publish the synonymy recorded on the holotype of *candezei*.

***Lanelater semistriatus* (Schwarz)**

*Agrypnus semistriatus* Schwarz, 1899 : 74.

*Lanelater semistriatus* (Schwarz) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens with a size-range of 22–23 mm from Deutsch Ost Africa [TANZANIA] collected by Bennigsen.

Syntype series: ? DEI, Eberswalde.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater sobrinus* (Candèze)**

*Agrypnus sobrinus* Candèze, 1887a : 190.

*Lanelater sobrinus* (Candèze) Arnett, 1952 : 105.

Lectotype (designated by Van Zwaluwenburg, 1959 : 351). SUMATRA: ♀, H. v. Hasselt, Boenga Maas. Palembang, Sumatra; *A. sobrinus* Cdz. n.sp. [Cand.] (RNH, Leiden).

Paralectotype: ♀, Dr B. Hagen, Tandjong Morawa, Serdang (N.O. Sumatra); *A. sobrinus* Cdz. *A. sobrinus* Cdz. n.sp. [Cand.]; 2 [Van Z.] (RNH, Leiden).

The second paralectotype, from the same locality as the lectotype has not been located.

***Lanelater soricinus* (Candèze)**

*Agrypnus soricinus* Candèze, 1882 : 1.

*Lanelater soricinus* (Candèze) Arnett, 1952 : 102.

The description is based on an unrecorded number of specimens from NEW GUINEA near Gelwink Bay in the Lansberge and Candèze collections.

Syntype examined: 1 ♂, Cote Sept. 136.30.137 [°E. = Geelvink Bay]; *soricinus* Cdz. n.sp. [Cand.]; Ex Museo Van Lansberge; Museum Paris. Collection Oberthur (MNHN, Paris).

The IRSNB, Brussels may possess additional syntypes.

***Lanelater substriatus* (Candèze)**

*Agrypnus substriatus* Candèze, 1857 : 25.

*Agrypnus extractus* Fleutiaux, 1902a : 162. [Synonymized by Schwarz, 1906 : 7.]

*Agrypnus extractus* var. *striatus* Fleutiaux, 1902a : 162.

*Lanelater substriatus* (Candèze) Arnett, 1952 : 105.

*Agrypnus substriatus* Candèze, LECTOTYPE (present designation). SENEGAL: ♂, Senegal; Janson coll. 1903.130; *substriatus* [Cand.]; *Agrypnus substriatus* Cand., Cand., type (e coll. de Laferté) [Janson] (BMNH).

Paralectotype: 1 ♀, Senegal, Janson coll. 1903.130; *Agrypnus substriatus* Cand. Cand. v [id] (e coll. de Laferté) [Janson] (BMNH).

The material from the Deyrolle collection has not been located.

*Agrypnus extractus* Fleutiaux. LECTOTYPE (present designation). CAMEROUN: ♂, Cameroun; *extractus* Fleut., type [Fleut.] (MNHN, Paris).

*Agrypnus extractus* var. *striatus* Fleutiaux. LECTOTYPE (present designation). SAN THOMÉ: ♀, San Thomé; *extractus* v. *striatus* Fleut., [Fleut.] (MNHN, Paris).

***Lanelater tippooi* (Candèze)**

*Agrypnus tippooi* Candèze, 1889 : 69 (3).

*Lanelater tippooi* (Candèze) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens from INDIA: Deccan méridional, Koimbatour.

Type-material: ?IRSNB, Brussels.

Confirmation of Arnett's generic attribution is based on the description.

***Lanelater tomentosus* (Fabricius)**

*Elater tomentosus* Fabricius, 1798 : 138.

*Agrypnus tomentosus* (Fabricius) Eschscholtz, 1829 : 32.

*Lanelater tomentosus* (Fabricius) Arnett, 1952 : 105.

The description is based on an unrecorded number of specimens from 'India orientali'. According to Zimsen (1964 : 158, no. 2612) this material has not been located.

Confirmation of Arnett's generic attribution is based on specimens standing as *tomentosus* in the BMNH.

***OCTOCRYPTUS* Candèze**

*Octocryptus* Candèze, 1892c : 486. Type-species: *Octocryptus cardoni* Candèze, by original designation.

At first sight the five species included in the genus bear a very close resemblance to the true Agrypninae. Examination of the underside immediately reveals the distinctive characteristics of the group, the deep grooves near the lateral margins of the propleurae for the accommodation of the antennae, and the fact that in repose the tarsi are lodged in grooves occupying the position of the posterior portion of the prosternopleural suture.

The relationship of this genus to other genera within the family is extremely uncertain. Candèze erected the tribe Octocryptites for the genus. Schenkling (1925 : 39) raised it to subfamily status while Fleutiaux (1941c) treats it as a subdivision (Octocryptitae) of the Agrypninae.

Fleutiaux (1944 : 145) gives a generic diagnosis and key to species. In addition to the diagnostic characters mentioned by Fleutiaux, the genus possesses the following features: the mesepimera do not attain the margin of the middle costal cavity, tibial spurs are absent and there are no setae at the base of each claw.

Fleutiaux (1944 : 145) states that he examined the types of the two species described by Candèze. However as Candèze did not record the number of specimens on which he based his descriptions and as Fleutiaux provides no means of identifying the specimens he examined, his statement cannot be accepted as valid lectotype designations for *cardoni* Candèze and *radula* Candèze.

DISTRIBUTION. Oman, India, North Vietnam, Sumatra.

BIOLOGY AND HABITS. Nothing is known of the life history of the species. Specimens have been found buried at some depth in leaf detritus near a river (Candèze, 1892c : 487) and near lakes, streams and in damp places (Fleutiaux, 1944 : 148).

***Octocryptus babaulti* Fleutiaux**

*Octocryptus babaulti* Fleutiaux, 1944 : 148.

LECTOTYPE (present designation). N. INDIA: Sex unknown. Bajaura, Kangra district (Indes Angl.); G. Babault, Juin 1914; boursouflures laterales du pronotum

[illegible word] de sillons tar. sur des propleurs; *Octocryptus babaulti* Fleut., type [Fleut.] (MNHN, Paris).

***Octocryptus cardoni* Candèze**

*Octocryptus cardoni* Candèze, 1892c : 486.

The description is based on five specimens captured by Cardon in July on the banks of the Sunk River in the Manguiers valley near Chichuani in Barwai (see note on Cardon's localities on p. 273).

Type-material: IRSNB, Brussels according to Fleutiaux, 1944 : 146. INDIA: 1 ex., Barwai; Collection Candèze; *Octocryptus cardoni* Cand. det. E. Cand. [IRSNB curatorial label]; cf. Ann. Soc. Ent. Belge VI, 1892 p. 487; ex typus; *cardoni* Cand. Mus. Bruxelles, échange 1943 [Fleut.] (MNHN, Paris).

***Octocryptus coomani* Fleutiaux**

[*Octocryptus cardoni* Candèze; Fleutiaux, 1927 : 100, fig. Misidentification.]

*Octocryptus coomani* Fleutiaux, 1944 : 148.

LECTOTYPE (present designation). NORTH VIETNAM: ♂, Tonkin, Lac Tho, A. de Cooman; *O. coomani* Fleut., type, *cardoni* Fleut. non Cand. [Fleut.] (MNHN, Paris).

Paralectotypes: 2 ex., same locality as the lectotype one with a note: a terre dans le voisinage des etangs, ruisseaux, terrains humides en compagnie de Compositae. 1 ♀, same locality as the lectotype: exemplaire figuré par Jeannel [probably in Fleutiaux, 1942, *Revue. fr. Ent.* 9 : 79 as *cardoni*]; *Octocryptus coomani* Fleut. [Fleut.]. 1 ♀, same locality as the lectotype; type figure Faun. col. Franc. 1927 p. 100; *cardoni* Fleut. pars 1927, sp.? [Fleut.] (MNHN, Paris).

***Octocryptus maindroni* Fleutiaux**

*Octocryptus maindroni* Fleutiaux, 1944 : 148.

LECTOTYPE (present designation). OMAN: ♀, Mascate [= Muscat or Musquat] (Sept. Oct.) Maindron 133-96; *Octocryptus maindroni* Fleut., type [Fleut.] (MNHN, Paris).

***Octocryptus radula* Candèze**

*Octocryptus radula* Candèze, 1893b : 14.

The description is based on an unrecorded number of specimens from SUMATRA, Padang.

Type-material: IRSNB, Brussels according to Fleutiaux, 1944 : 147. Not examined.

## CHECKLIST OF THE GENERA INCLUDED IN THE AGRYPNINAE

**ADELOCERA** Latreille

[*LACON* sensu Germar nec Castelnau.  
Pars.]

*AGRAEUS* Candèze. **Syn. n.**

*PERICUS* Candèze. **Syn. n.**

*BRACHYLACON* Motschulsky.

**Syn. n.**

*TRACHYLACON* Motschulsky.

*CAVICOXUM* Pic.

*PROLACON* Fleutiaux. **Syn. n.**

*AGANOLACON* Ohira. **Syn. n.**

**SCAPHODERUS** Candèze

*BRUYANTIUS* Fleutiaux.

**Syn. n.**

**LACON** Castelnau

[*ADELOCERA* sensu auct. nec  
Latreille.]

*LEPIDOTUS* Stephens nec Asso.

*OCNEUS* Candèze. **Syn. n.**

*SCELISUS* Candèze. **Syn. n.**

*ALAOTYPUS* Schwarz.

*SULCILACON* Fleutiaux. **Syn. n.**

*DIPHYAULON* Arnett. **Syn. n.**

*AULACON* Arnett. **Syn. n.**

*ZALEPIA* Arnett. **Syn. n.**

*KOBULACON* Chujo & Ohira.

**Syn. n.**

*LEPIDELATER* Smith. **Syn. n.**

*ARNETTIA* Golbach. **Syn. n.**

*MONOCYRTON* Golbach. **Syn. n.**

*CORNILACON* Golbach. **Syn. n.**

*LATILACON* Golbach. **Syn. n.**

**CANDANIUS** nom. n.

*ANIUS* Candèze nec Pascoe.

**DANOSOMA** Thomson.

*DELOX* Quelle.

**EIDOLUS** Candèze.**OPATELUS** Candèze.**ACROCRYPTUS** Candèze.

*CRYPTOTARSUS* Philippi nec  
Kirsch.

*HEXAULACUS* Candèze.

**DILOBITARSUS** Latreille.

*ANACANTHA* Solier. **Syn. n.**

**ELASMOSOMUS** Schwarz.**HEMICLEUS** Candèze.**AGRYPNUS** Eschscholtz.

[*LACON* sensu Germar nec  
Castelnau. Pars.]

*MECYNOCANTHUS* Hope.

**Syn. n.**

*TYLOTARSUS* Germar. **Syn. n.**

*TILOTARSUS* Candèze.

*MYRMODES* Candèze. **Syn. n.**

*ARCHONTAS* Goezis.

*PSEUDOLACON* Blackburn.

**Syn. n.**

*HOMEOLACON* Blackburn.

**Syn. n.**

*LOBOTARSUS* Schwarz. **Syn. n.**

*LOBITARSUS* Fleutiaux.

*ENOPLADERES* Schwarz nec  
Faldernan.

*CENTROSTETHUS* Schwarz.

**Syn. n.**

*COMPSOLACON* Reitter.

*PARALACON* Reitter. **Syn. n.**

*NEOLACON* Miwa. **Syn. n.**

*COLAULON* Arnett. **Syn. n.**

<i>CRYPTOLACON</i> Nakane & Kishii. <b>Syn. n.</b>	<i>RISMETHUS</i> Fleutiaux.
<i>SABIKIKORIUS</i> Nakane & Kishii. <b>Syn. n.</b>	<i>TRIERS</i> Candèze.
<i>SAGOJO</i> Kishii. <b>Syn. n.</b>	
<i>SAGOJO</i> Ohira.	<i>LANELATER</i> Arnett.
<i>ARCHONTOIDES</i> Cobos. <b>Syn. n.</b>	[ <i>AGRYPNUS sensu auct. nec</i>
<i>PYRGANUS</i> Golbach. <b>Syn. n.</b>	Eschscholtz.]
	<i>AMAURUS</i> Castelnau nec
	Burmeister.
<i>MERISTHUS</i> Candèze.	
Subgenus <i>MERISTHUS</i> Candèze.	
<i>RHACIASPIS</i> Arnett.	
Subgenus <i>SULCIMERUS</i> Fleutiaux.	<i>OCTOCRYPTUS</i> Candèze.

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## SOME NOTES ON THE COLLECTIONS CONSULTED

Where no reference is given the information concerning the present location of a collection was obtained from Horn and Kahle (1935-1937) and confirmed by correspondence with the present owner or by personal inspection of the collection. References are given to all other sources of information.

Albertis, Luigi Maria d' (1841-1901). See Beccari.

Alluaud, Charles (1861-1949). Madagascan material (except Carabidae) and specimens collected in East Africa with R. Jeannel to MNHN, Paris.

Andrewes, Herbert Edward (1863-1951). Coleoptera (except Carabidae) to BMNH.

Candèze (1893c) described a number of species from the H. E. Andrewes collection. He appears to have retained the unique holotypes of some species (e.g. *Pericus sanguinolentus*) which are now in the IRSNB, Brussels and returned half of longer series (e.g. 3 out of 6 *L. pistoreus*) to Andrewes.

Bakewell, Robert (1910-1867). Elateridae via Neervort van de Poll and Fleutiaux to MNHN, Paris.

Bates, Henry Walter (1825-1892). Elateridae via Janson and Godman and Salvin to BMNH.

Beccari, Odoardo (1843-1892). Material collected in Java, Celebes, Timor, etc., with d'Albertis (1871-1876) to MCSN, Genoa. Candèze (1878a) described a number of species from this material but up to the present time I have been unable to discover whether he retained any of the specimens. If he did, they should be in the IRSNB, Brussels. African collection to MCSN, Genoa.

Blackburn, Thomas (1844-1912). Blackburn did not publish designations of type-specimens or record the number of specimens on which he based his descriptions. He was, however, in the habit of marking one specimen of each species, with the letter 'T' in red ink. Up to the present time these specimens have been accepted as types. In 1910 the BMNH purchased a collection of 698 such 'types' from Blackburn. Since Blackburn obviously intended his type-material to be preserved in the BMNH, I have designated lectotypes from the material in that collection. The rest of Blackburn's collection, which presumably contains the remainder of any syntype series, was acquired by the SAM, Adelaide and part by C. French (q.v.).

Van Zwaluwenburg (1959 : 352, under *lindensis* Blackburn) states that the numbers on the card mounts of Blackburn's specimens may perhaps refer to a locality in Blackburn's register deposited in the SAM, Adelaide. I have not confirmed this.

Bosc d'Antic, L.A.G. (1759-1825). The Bosc collection was acquired by the MNHN, Paris in 1828. Zimsen (1964 : 17) believed that the Coleoptera had been lost or destroyed. The discovery of the type-material of *E. pennata*

Fabricius (p. 62) and *E. varius* Olivier (p. 79) has shown that this is not the case.

Candèze, Ernest Charles Auguste (1827–1898). Candèze's real interest lay in the Lamellicorns, but Lacordaire persuaded him to undertake the classification of the Elateridae. As he had no intention of continuing work on this family once the Monograph was finished, Candèze did not build up a large collection of his own but based his work on material sent to him on loan by Museums and owners of private collections (1857: VII–VIII). Fortunately Candèze made a habit of recording the names of the owners of the specimens he described. In those cases where he does not mention the owner, I have assumed that the material was in his own possession.

On completion of the Monograph in 1864 Candèze negotiated an exchange with Janson, giving him some ('quelques', Fleutiaux, 1945 : 79) of the Elaterid types in his possession in return for La Ferté Sénectère's Lamellicorns. The exchange took place in 1869. Janson (q.v.) appears to have retained Candèze's material which is now preserved in the BMNH. The BMNH possesses a manuscript catalogue of the Janson collection made by Waterhouse. In it Waterhouse records that 'Mr Janson's collection comprises La Ferte's as well as Candèze's'.

The publication of the Monograph established Candèze as the acknowledged Elaterid specialist and he found that he was unable to carry out his intention of abandoning the family. Instead he embarked on a revision of the Monograph, which unfortunately remained unfinished, and began to build up a collection of Elateridae. At the time of his death he was the owner of a large and comprehensive collection which included the Elaterid collections of Lacordaire, Laporte de Castelnau, Reiche (8 boxes), Semper (Philippine material), Buquet, Monchicourt (including Raffray's Zanguebar collection), Mniszech, Gebler, Falderman, Duport, Helmberg (Alaskan material), Wallace (New Guinea, etc.) and Fairmaire's exotic material. This second collection which presumably included any specimens, including syntypes, retained in 1869, was purchased by the Belgian government in 1899 (1899, *Annls Soc. ent. Belge* 34 : 31, report) and is preserved in the IRSNB, Brussels.

Candèze described a number of species from 'des Indes-Orientales'. Subsequent records of certain species (e.g. *Adelocera tostus* (= *Agrypnus* of the present work) (Candèze), Fleutiaux, 1927 : 78) suggest that this rather imprecise locality includes eastern India, Burma, Thailand, Indochina, Malaya and Indonesia. In many cases Janson's replacement locality labels bear only the word 'India'.

Fleutiaux (1945 : 81) states that Candèze was in the habit of retaining the specimens submitted to him for identification. Experience (see note on the Andrewes collection p. 270) has shown that this was not always the case.

Except in those cases in which he had only a single example, Candèze did not generally record the number of specimens on which he based his description. In addition he did not always record the exact locality on the specimen so that the published locality and that on the type material do not always agree.

Candèze was not consistent in the way in which he labelled his specimens. In most cases he seems to have placed his determination label on the first specimen of a series. Many Candèze specimens in the BMNH bear large paper labels with coloured borders (blue = Africa, yellow = Asia, red = Australia, etc.) with the generic and specific names together with those of the author and collector written in his normal handwriting. On other occasions he used a small scrap of paper on which he wrote only the specific name. A large number of specimens in the IRSNB, Brussels, bear large stiff card labels with coloured borders. One of these is illustrated in Horn, 1936: p. 21, fig. 22. The handwriting, a form of printing, differs from that on the BMNH labels. I believe that these labels may have originally been pinned in the boxes above or below the species rather than attached to the specimens themselves. Candèze sometimes wrote the word 'type' on his determination labels, but he does not appear to have done so for every species he described.

It is unfortunate that when Janson acquired part of the Candèze collection he considered it necessary to replace Candèze's determination labels with his own. Sometimes Candèze's labels have been trimmed and stuck to the underside of the new labels, but more often they seem to have been removed.

Fleutiaux (1945) published a detailed account of the history of the Candèze collection.

Cantor, Dr Theodore Edward (1809-1860). Dr Cantor of the Bengal Medical Service accompanied the military expedition to Chusan [Chushan, China] with instructions to collect objects of Natural History for the Court of Directors of the East-India Company (Cantor, 1842 : 368). The expedition travelled by way of Penang, Singapore and the island of Lantao in the Canton River, where it remained for the whole of the month of June, 1840. The occupation of Chusan lasted from July 1840 to March 1841. A collection of insects made in Chusan was presented to the East-India Company in 1842 (Cantor, 1842 : 278 and Horsfield and Moore, 1857 : 2) and a duplicate series was sent to the Entomological Society of London (Cantor, 1842 : 278).

The BMNH acquired part of the East-India Company's collection when it was broken up in 1860. The BMNH also acquired the type-material belonging to the Entomological Society before its collections were sold by auction between 1859 and 1863.

Hope (1843) described a number of species from Chusan and Canton collected by Cantor but does not record whether the specimens belong to the East-India Company, the Entomological Society or whether he had acquired them himself. Hope seems to have had some of Cantor's material in his possession as two specimens believed to be the types of two species (*Melolontha chinensis* and *Anomala controversa*) described by Hope in 1843 are in the UM, Oxford. However Candèze's comments (1859 : 235, 405 and 1863 : 242) that he saw the types of *Ludius luteipes*, *crocopus* and *quadrilineatus* Hope, 1843 in the Indian Museum and Crotch's (1873 : 41) remark that he inspected the types

of *Coccinella 18-spilota*, *succinea* and *tetraspilota* Hope, 1843 in the same museum leaves little doubt that Hope probably based most of his descriptions on specimens belonging to the East-India Company.

Inspection of the BMNH collection has shown that it contains specimens regarded by a number of different workers as the types of 39 of the 49 species described by Hope in 1843. A few specimens lack registration labels but the remainder bear labels indicating that they were acquired from the East-India Company. Most specimens bear a small round label with the word 'China' on one side and 'Dr Cantor' on the reverse but a few are labelled 'Penang'.

The unknown author of a short biography of Cantor cut from an unidentified publication and pasted on three cards in the BMNH library card index remarks that 'many of his [Cantor's] data as regards the locality—particularly those labelled Penang are incorrect'. The writer appears to be referring to Cantor's collection of reptiles and amphibians but I suspect (see *orientalis* Hope p. 192) that the same may apply to the insect collection.

Cardon, René P. (1879—[date of death unknown]). Père Cardon, Jesuit missionary in India and keen insect collector, sent specimens collected in Chota Nagpore, Tetara, Konbir-Nawatoli and later at Barwai to his friend and colleague Père Renard, Préfet des Etudes du Collège St Servan at Liège (Candèze, 1890: CXLVII). These collections have not been located, but it seems probable that Candèze acquired the Elateridae. The IRSNB, Brussels, Oberthur, Fleutiaux and Fry collections all contain specimens collected by Cardon and determined by Candèze.

Specimens believed to form part of the syntype series of certain species (e.g. *succinatus* Candèze, p. 48) do not bear locality labels corresponding to the published type locality. Instead they are labelled 'Bengal' or 'Chota Nagpore'. It is assumed that Candèze obtained more detailed information from Cardon.

Candèze (1890: 46) describes Chota Nagpore as 'un province du Bengale occidentale s'entendent au sud de la grande plaine du Gange' and two years later (1892c: 481) he quotes Cardon's companion P. Maene, S.J., who describes their parish as 'Le Barwai' [=Barwa 23°12'N., 84°18'E.], le Chechari, le Kasir et une partie de Noaghar . . . qui sont compris entre 22°58'N. and 33°30'N. and 84°E. and 84°30'E.' The area is traversed by the rivers Sunk [=Sankh] and Koel.

Castelnau, Francis L. N. de C. de Laporte. Comte de (1810–1880). Material from North and South America to MNHN, Paris. First private collection to NMV, Melbourne. The Elateridae of his second collection, which were in rather poor condition, were offered for sale by Deyrolle and purchased by Candèze (q.v.) in 1872.

Some writers refer to this worker as Laporte. Musgrave (1932: 180) states that at first he wrote under the name of Laporte or Delaporte but later that of Castelnau. Both the Schenkling catalogue (1925) and the Derksen and

Scheiding bibliography (1963) use the name Castelnau. Personal preference is the reason for the use of Castelnau is this work.

Chevrolat, Louis Alexandre August (1799–1884). At his death his Elateridae were acquired by Fleutiaux and are now in the MNHN, Paris. Fleutiaux retained Chevrolat's large coloured determination labels. The specimens also bear a printed 'Collection Chevrolat' label.

David, Armand (1826–1900). His first collection was destroyed. Later collections were broken up: part was acquired by the MNHN, Paris, part by Oberthur (now in MNHN, Paris) and part by the Institut Catholique de Paris [not confirmed]. At his death his private collection was acquired by Oberthür.

Dejean, Pierre Francois Marie Auguste, Comte (1780–1845). Elateridae via H. L. Gory, La Ferté Sénectère, Janson and Godman & Salvin to BMNH.

Deyrolle, Achille (1813–1865). Elateridae passed via Janson to BMNH. I have assumed that the Deyrolle to whom Candèze refers in the Monograph is A. Deyrolle and not his son Emile or brother Henri.

Dohrn, Carl August (1806–1892). His collection was acquired, part direct and part through his son, by the Museum für Naturkunde, Stettin (Szczecin). At least part of the Stettin collection is now preserved in the IZPAN, Warsaw.

Dupont, E. ( ) and (Richard) Henry (1798–1873). The Dupont brothers were dealers in natural history specimens trading in Paris. They also undertook collecting expeditions. Germar (see *Agrypnus terrenus* (= *crenatus* Klug) p. 144, *turbidus*, p. 224, probably obtained some of his material from the Duponts. In 1846 Mniszech (q.v.) obtained a collection of Elateridae from Dupont (Candèze, 1895b : 51) and another collection acquired by Reiche passed to Janson (q.v.).

Elston, Albert H. (1890– ). Elston generally based his descriptions on an unrecorded number of specimens from several localities adding 'type in the author's collection' or 'in the South Australian Museum' [Adelaide]. He did not record the location of the rest of the material. Elston's collection is now in the AM, Sydney. Neboiss's (1956, 1961) records suggest that where Elston's 'type' is in his own collection, some or all of the remaining specimens were acquired by the SAM, Adelaide, and where the 'type' was in that museum, some or all of the remaining material was retained by Elston and is now in the AM, Sydney.

Since Elston did not publish any means of identifying his types, lectotype designations should be made, but with due regard to Elston's intention concerning the location of the type. In this work, where Elston's specimens are preserved in more than one place the first named corresponds to the location of Elston's 'type'.

Eschscholtz, Johan Friedrich (1793–1831). Collection in ZMU, Moscow and also some material in ZMU, Helsinki. Not confirmed.

Fairmaire, Léon (1820–1906). Fairmaire appears to have disposed of parts of his collection during his lifetime. Candèze acquired a collection of exotic Elateridae in 1894 (now in the IRSNB, Brussels) and Fleutiaux acquired a second collection of exotic and American specimens (now in the MNHN, Paris). The collection in his possession at the time of his death is in the MNHN, Paris.

Fea, Leonardo (1852–1903). Explorer and naturalist. The main part of his collection is in the MCSN, Genoa. Duplicates were acquired by other museums and private collectors. An account of his travels in Burma will be found in Fea (1896). Candèze (1891 : 771) records a number of species from Carin Cheba collected by Fea. He describes the locality as 'Les montagnes des Carin, à une cinquantaine des lieues au nord du Rangoon et à une hauteur de 900 à 1500 metres.' This is presumably the district of Burma now known as Karen.

Fleutiaux, Edmond (1858–1951). At his death his large and valuable collection was acquired by the MNHN, Paris. It contains specimens from many other collections. In most cases these are easily recognizable, as Fleutiaux retained all original labels and often added his own to indicate the provenance of a specimen. The collection also contains notes on type-material in other collections. Fleutiaux did not generally record the number of specimens on which he based his description, nor did he designate types. However, he was in the habit of marking one specimen as the type, usually by writing the word 'type' on the determination label. Wherever possible I have designated the specimen so marked as the lectotype.

French, Charles (1840–1933). First collection via Lansberge and Oberthür to the MNHN, Paris. Second collection to Neervoort van de Poll (q.v.). Third collection to NMV, Melbourne.

Germain, Philibert (1827–1913). Elateridae via Janson and Godman and Salvin to the BMNH. Some of his material was acquired by Oberthür (q.v.) and the Museo Nacional, Santiago, Chile (not confirmed).

Germar, Ernest Friedrich (1786–1853). Germar's collection was broken up. The Curculionidae passed to the University Zoological Museum, Halle (now the Zoological Institute of the Martin Luther University, Halle Wittenburg). This is confirmed by Dr Husing, who adds that the collection does not contain any Elateridae. The remainder of the collection passed to his nephew, Dr H. Schaum. Schaum seems to have retained some of the Elateridae (see p. 280) but he appears to have disposed of material belonging to other families (see Horn & Kahle, 1936 : 241) partly to the NMHU, Berlin and partly to the DEI, Eberswalde.

Gerstaecker, Carl Edward (1828–1895). Curator at the MNHU, Berlin, until about 1876. He appears to have relabelled the Coleoptera collection, replacing many old labels including those of Klug, Herbst and Germar.

Goudot, Justin ( ). Dealer in natural history specimens in Paris. Lived and collected for some time in Tananarive, Madagascar. In 1830 (Candèze, 1895b : 50) he sent specimens from Imerina to H. Dupont (q.v.), the MNHN, Paris and MNHU, Berlin.

Harris, Thaddeus William (1875–1856). Say based the description of several species (e.g. *Elater obtectus*, *aurorata*) on specimens submitted by Dr Harris. The Harris collection passed to the Boston Society of Natural History. Dr R. Lutts, curator of collections at the Boston Museum of Science informs me that in the late 1940's the Society's collections were transferred to a number of other institutions. Professor P. J. Darlington has informed me that the Harris collection, and also his notebooks, are now in the MCZ, Harvard. The collection appears to contain only one Agrypnine specimen which could be part of Say's type-material. (See *Lacon auroratus* (Say) p. 57).

Horn, George Henry (1840–1879). Coleoptera to the ANS, Philadelphia.

Janson, Edward Wesley (1822–1891). Dealer in natural history specimens in London. His collection of Elateridae which included the Elateridae from many older collections was acquired by Dr F. D. Godman who presented it to the BMNH. The specimens bear the registration number 1903.130. Janson is known to have been in the habit of replacing old labels with his own. On these he generally recorded the generic, specific and author's names, and also the name of the person responsible for naming the specimen. He often included the name of the original owner of the specimen, e.g. *Lacon occidentalis* Cdze. Cand. [identified by] Type e coll. de Laferté [original owner].

Kraatz, Gustav (1831–1909). Collection acquired by the DEI, Eberswalde.

Knoch, August Wilhelm (1742 : 1818). Zincken (1818) published a short biography in which he records that Knoch's collection, which appears to have been quite a large one, was for sale at 1,000 Thaler in gold. Hagen (1862 : 425) records that the collection is in the ZMHU, Berlin, but Dr Hieke writes that the Museum appears to possess only part of the Knoch collection. Unfortunately the records of how the collection was acquired and its contents cannot be found. What happened to the remainder of the collection is unknown.

La Ferté – Sénectère, F. Thibault de (1808–1866). Part of his collection was acquired by Janson in 1864. Janson sold most of the families separately but retained the Elateridae which passed, with his collection, to the BMNH. Some specimens bear a BMNH registration label 'Janson Coll. ex. La Ferté 1903.130' while others have the ordinary Janson coll. registration labels with Janson's replacement locality labels with the abbreviation 'Laf.' or 'e coll. Laferté'.

Lansberge, Johan Wilhelm van (1830–1905). Coleoptera to Oberthür (q.v.). Duplicate material to IRSNB, Brussels, and Neervoort van de Poll (q.v.).

Laporte, Francis L. de, Comte de Castelnau, see Castelnau.

Latreille, Pierre Andre (1762-1833). His first collection was acquired by Dejean (q.v.) in 1826. The Elateridae of the second collection were acquired by Janson (q.v.).

LeConte, Henry (1825-1883). North American Coleoptera to MCZ, Harvard.

LeConte's specimens bear small coloured paper disks. Professor P. J. Darlington informs me that the colours are believed to indicate the following localities:

pink	= Middle States
brick red or orange	= Southern States
yellow	= Western States
dark red	= Texas
light green	= Nebraska & C [so forth]. In the past Nebraska was the name of a much larger area.
dark green	= New Mexico
blue	= Oregon & C. Oregon territory formerly included Washington State
light blue-grey	= Lake Superior

Lewis, George (1839-1926). Lewis's collection of Coleoptera from Japan, China and Ceylon was acquired by the BMNH in four instalments which were registered as follows: 1910 : 320, 1911 : 298, 1912 : 276, 1913 : 256.

Lewis paid two visits to Japan, the first in 1867-1872 and the second in 1880-1881. Bates (1883) gives an account and detailed itinerary of the second visit.

Lewis submitted the Elateridae collected in the course of the first visit to Candèze, who published a paper based on this material in 1873. Lewis (1894 : 36) records that Candèze returned the specimens to him but the presence of specimens from Lewis's first journey in the IRSNB, Brussels, suggests that Candèze retained representatives of some species. Some of the specimens may be syntypes. Lewis appears to have relabelled some of the specimens returned by Candèze. For example, *Lacon tumens* Candèze (see p. 49) was described from a single specimen. The BMNH possesses a single male from the Lewis collection which agrees well with the description but bears a determination label, 'Lacon tumens n. sp. Cdze' in Lewis's handwriting. Similarly the specimen of *L. scrofa* (see p. 208) which most closely resembles the description is in the Lewis collection without Candèze's determination label but with Lewis's label 'Lacon scrofa n. sp. Cdze'.

Lewis described the Elateridae collected on the second expedition himself. Except in those cases in which he possessed only a single specimen, he did not generally record the number of specimens he had before him at the time of the description. His remark (1894 : 26) that 'the localities given are selected to furnish some information regarding the distribution of the species' suggests that he did not record the localities of all the specimens on which the description

was based. Lewis did not place a determination or locality label on every specimen of his series nor was he consistent in marking one specimen as the type. Where there is sufficient evidence that a particular specimen formed part of Lewis's original series this specimen has been treated as a syntype even though the locality on the label differs from that published or there is no locality label at all.

Long, Major S. H. For an account of the expedition from Pittsburgh to the Rocky Mountains see James (1823). The material collected on this expedition has not been traced. See also Say, p. 279.

Mniszech, George Vandelin (1824-1881). Mniszech's collection was purchased by Lansberge, who sold the Elateridae to Candèze (q.v.) in 1871 (Candèze, 1895 : 51, Fleutiaux, 1945 : 80). This material is now in the IRSNB, Brussels.

Mniszech acquired some of Dupont's Madagascan material in 1846. His collection also contained those of Gebler, Falderman, Helmberg, Kindermann, Deyrolle and many specimens collected by Wallace in New Guinea. According to Fleutiaux (1945 : 81) all the old labels were removed for display purposes.

Candèze described a number of species from Mniszech's collection before it came into his possession. It would appear that in some cases he retained the specimens (e.g. *Lacon nodicollis*, see p. 191, *L. sinuatus*, see p. 213) or part of the series (e.g. *Lacon eximus* see p. 152) on which he based the descriptions as they were acquired by the BMNH with his first collection and are not in his second collection in the IRSNB, Brussels.

Modigliani, Elio (1860-1932). Collections made in Nias, Sumatra, Enggano (May-June 1891) and Mentawai are in the MCSN, Genoa. Any specimens described and retained by Candèze should be in the IRSNB, Brussels.

Mochul'skii, V. I. de. See Motschulsky.

Motschulsky, Victor Ivanovic de (c. 1810-1871). The Russian Coleopterist used this form of his surname in both the publications consulted in the course of this work. For the last hundred years or more coleopterists have used this spelling and the abbreviation 'Motsch'. In my opinion no useful purpose is served by changing the familiar spelling.

Horn (1936 : 183) states that the Motschulsky collection is in the ZMU, Moscow, and the Zoological Museum, Leningrad, while the Naturforschender Verein, Riga, the MNHU, Berlin and the DEI, Eberswalde, possess 'duplicates'. However enquiries have shown that neither of the German institutions possess Coleoptera determined by Motschulsky.

Fleutiaux (1932e : 79) records that the Motschulsky collection suffered considerable damage before it was acquired by the ZMU, Moscow. He does not mention any material in other institutions. Fleutiaux was fortunate in that through the kindness of the curator, Mr Kuzin, he was able to examine the specimens regarded as Motschulsky types and his collection contains a number of specimens of Motschulsky species labelled 'comparé au type'.

Motschulsky did not record the number of specimens on which he based his descriptions nor did he designate type-specimens.

Murray, Andrew (1812-1878). Received collections of beetles made by the staff of the Presbyterian missionary station at Old Calabar [Nigeria]. He submitted (1857: 153) many Elateridae to Candèze. Whether Candèze returned any or all of the material to Murray is unknown. On his death, Murray's collection was sold by auction. Janson (q.v.) acquired the Elateridae. Any specimens retained by Candèze should be in the IRSNB, Brussels.

Neervort van de Poll, Jacob R. H. (1862-1925). Exotic Elateridae via Fleutiaux to the MNHN, Paris.

Oberthür, René (1852-1944). The Oberthür collection was declared a National Monument in 1952 and is now housed in the MNHN, Paris. A note in the *Entomologische Blätter* 55 (1960): 282 states that part of the Oberthür collection, including a number of Coleoptera, was acquired by the Museum A. Koenig in Bonn. Dr H. Roer informs me that this material consists of a collection purchased from Oberthür by Dr Höne. The Agrypninae in the collection lack locality labels.

Oberthür retained only the best specimens of the collection he purchased, re-selling the rest to Neervort van de Poll (q.v.) and H. Donckier, a dealer in insects. Oberthür does not appear to have been interested in the Elateridae. His collection includes some 150 boxes containing both determined and undetermined Elateridae from all parts of the world. As they are found, type-material and determined specimens are being transferred, with labels to show their provenance, to the general collection of the MNHN, Paris.

Philippi, Rudolph Amandus and Friedrich Heinrich Euonom (1838-1910, father and son). Collection to the Museum Nacional, Santiago, Chile (not confirmed). R. A. Philippi was at one time director of the Museum Nacional, Santiago.

Raffray, Achille (1844-1923). Coleoptera of Abyssinia and Ethiopia via F. Monchicourt and E. Candèze to the IRSNB, Brussels.

Sallé, Auguste (1820-1896). Dealer in natural history objects in Paris. As a boy (about 1831-34) he collected, probably for Chevrolat, in the Southern U.S.A., W. Indies, Central America and Venezuela. His own collection of Central American and Mexican Elateridae was acquired by Godman and Salvin and presented to the BMNH.

Saunders, William Wilson (1809-1879). His collection was broken up by Janson, who retained some of the Elateridae (e.g. *Lacon comptus* Candèze, see p. 142). The remainder was acquired by Neervort van de Poll (q.v.).

Say, Thomas (1887-1834). Both LeConte (1859a: VI) and Ord (1859a: XIX, footnote) record that Say's collection was entirely destroyed. Horn (1936: 240) records that such as remains of Say's collection is in the ANS, Philadelphia,

but Miss P. Schuyler reports that the collection does not contain any beetles from the Say collection.

Say described several species based on specimens he collected while he was with Major Long's expedition to the Rocky Mountains in 1819-20 (Say, 1825 : 259). It seems probable that he retained them and that they were destroyed with his collection. However, if he did not retain them, they may have passed, with other material collected on this expedition, to Peales Philadelphia Museum (Horn & Kahle 1937 : 369). This collection suffered many vicissitudes and was finally broken up (Colston, 1909). Part passed, via the Boston Museum to the Boston Society of Natural History and part to Barnum's American Museum which was destroyed by fire. Mr R. Lutts, Curator of collections at the Museum of Science, Boston, where the Boston Society collection was housed, has informed me that in the early 1940's the bulk of the Society's research material was transferred to other institutions including Boston and Harvard Universities. Mr Lutts adds that he can find no reference to Major Long's expedition or Peale's Philadelphia Museum material in the accession records. There seems little hope of tracing this material.

Schaum, Herman Rudolph (1819-1865). A nephew of E. F. Germar, he was also interested in the Elateridae and appears to have retained at least part (see Candèze, 1857 : 132 and 100) of his uncle's Elaterid collection. Part of Schaum's collection was acquired by Janson and is now in the BMNH. What became of the rest of the Schaum collection is unknown. The BMNH possesses a manuscript list entitled 'Catalogus Elateridarum collectionis Schaumii'. It appears to be a list of the Schaum Elateridae acquired by Janson. Only a small proportion of Germar's species are included in the list.

Schwarz, Otto (1861-1908). Elateridae via O. Leonhard to the DEI, Eberswalde. Schwarz did not publish type-designations nor did he record the number of specimens on which he based his description or where they were preserved. Unless there is evidence to the contrary, I have assumed that his type-material is in his own collection.

Ulke, Henry (1821-1910). Coleoptera to CM, Pittsburgh.

Wahlberg, Johan August (1810-1856). Collected in 'Caffraria' from 1838 to 1845. For an account of his itinerary see Brink (1935 : 25-34). The material is now in the N.R., Stockholm. Boheman described *Lacon amplicolis* and *troglodytes* from 'tractitus fluvii Gariep' [Orange R.], *nanus*, *paenulatus* and *decipiens* from 'Terra Natalensi' and *parvus* from 'regione fluvii Limpopoensis'. Through the kindness of Dr Hallin, I have been able to examine all the syntype material of these species. None of the specimens bear labels corresponding to the published locality, only 'Caffraria' and 'J. Wahlb.'. In each case the specimen with Boheman's determination label bears a type label which I am given to understand was added at a later date as a matter of curatorial routine.

From Brink's account of Wahlberg's travels it would appear that the term

'Caffraria' is sufficiently wide to include all three localities. Pope (1960 : 206, 210) is of the same opinion.

Xantus de Vesey, John ( ). Horn (1894 : 302) records that the material collected in the Californian peninsula in 1859 and 1860 was deposited in the Smithsonian Institution and afterwards divided between Ulke (q.v.) and LeConte (q.v.).

The locality of the Xantus material is usually described as Cape St. Lucas. According to Horn (loc. cit.) this material was obtained in the region between San José del Cabo and La Paz.

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## INDEX

This index includes the names of all the genera and species included in the Agrypninae as defined in the Notes on the Key on p. 5. Species not known to me are recorded with the reference to the original description and the original generic attribution. Only the original spelling is shown for adjectival specific names whose endings are liable to change according to the generic gender. Invalid names are in *italics*. Where a name appears more than once in the text the reference to the main entry is given in **bold** type.

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A CONSPECTUS  
OF THE TACHINIDAE (DIPTERA)  
OF AUSTRALIA, INCLUDING KEYS  
TO THE SUPRASPECIFIC TAXA  
AND TAXONOMIC AND HOST  
CATALOGUES



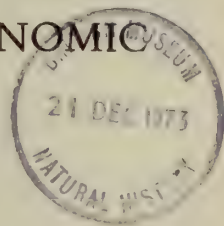
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BY  
ROGER WARD CROSSKEY

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# A CONSPECTUS OF THE TACHINIDAE (DIPTERA) OF AUSTRALIA, INCLUDING KEYS TO THE SUPRASPECIFIC TAXA AND TAXONOMIC AND HOST CATALOGUES

By R. W. CROSSKEY

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## SYNOPSIS

A detailed conspectus is provided of the Australian Tachinidae, a group that has hitherto lacked any taxonomic synthesis. Original keys are given to the family-group taxa and to the genera and subgenera so far recognized in the fauna; many undescribed forms are known and the preliminary nature of the keys is therefore emphasized. Preliminary characterizations are given for family-group taxa to aid towards formalized diagnoses on a world basis. A complete systematic catalogue is given of all described Australian Tachinidae, based upon an examination of almost all extant primary types, and the known host relations are shown by up-to-date host-parasite and parasite-host lists. Nomenclatural changes established in the taxonomic catalogue are summarized and include 14 new genus-group synonyms, 26 new species-group synonyms, 83 new generic combinations, and two new names for preoccupied homonyms; 12 lectotypes are newly designated. An annotated glossary is included of the terms used in the taxonomy of adult Tachinidae, and figures are given to illustrate the glossary and the keys.

## PREAMBLE

AUSTRALIA possesses a rich and varied tachinid fauna, most of which is still undescribed. Some 420 named species are recognized at present, but it is obvious from an examination of unidentified material in the collections at Canberra and London that this number represents only a small proportion of the species that will ultimately be recognized: it is probable that when fully worked out the Australian Tachinidae will muster some 1500–2000 species.

This fauna, though not enormous by the standards of some insect families, presents considerable taxonomic difficulties (Colless & McAlpine, 1970) and it will certainly be many years before any comprehensive monographic treatment can be prepared and the multifarious new genera and species adequately described and named. In the meantime the practical identification of Australian Tachinidae is bound to present a problem for which the services of a specialist in the group are likely to be required, if only to distinguish rapidly the known from the unknown elements in the fauna. At present there is no full-time Australian specialist working on the group, despite the fact that there is a very real need for taxonomic studies to be undertaken on the Australian tachinids because of their role as parasites of other insects and their potential importance as biological control agents. Australia suffers from many serious insect pests of economic significance (such as the chafer-grubs of sugar-cane and the *Eucalyptus* defoliators), all of which are attacked by tachinid parasites that are assumed to play an important part in naturally regulating the populations of their hosts; few attempts have yet been made, however, to exploit the Tachinidae of Australia for biological control purposes.

It will be an essential prerequisite for future investigations into the value of Australian tachinids as biological control agents that the flies themselves can be rapidly and accurately identified. At the moment only a small fraction of the fauna can be so named, since the great bulk of species remain unstudied and undescribed. An enormous untouched taxonomic field, with a direct bearing on the practical control of insect pests, awaits the Australian student willing to take up the systematics of the Australasian Tachinidae as a whole (attention cannot

be paid solely to continental Australia as much of the fauna is held in common with that of New Guinea and the Pacific islands and in some instances with areas still further afield).

Up to now Australian dipterists have been deterred from working on their local tachinid fauna by the practical difficulties of knowing where to start in the absence of any comprehensive revisionary works and scarcely any keys, and by the fact that so many of the type-specimens are housed in collections outside Australia. For some time there has been a need for a synthesis of existing taxonomic knowledge which will provide a foundation upon which future work can be developed, and the object of the work here presented has been to provide a synthesis of this kind. The work has been based on a study of the Australian Tachinidae carried out at intervals over the last ten years, and its aims are to provide: (a) a classification of described forms and a classificatory framework into which new forms can be fitted, with whatever modifications may be necessary, as they are described; (b) preliminary characterizations of the subfamilies and tribes recognized in the fauna and keys to family-group taxa; (c) identification keys to the described genera and subgenera; (d) a taxonomic catalogue, based upon an examination of all available primary types and geographically annotated; (e) a catalogue of known hosts; and (f) an illustrated glossary of the terms used in the taxonomy of adult Tachinidae that will aid the would-be student in acquiring a knowledge of the group. It has not been practical at this stage, when many genera remain in need of complete revision, to provide keys to species and descriptions of species, and it should be noted that some of the species names listed in the catalogue may prove to be synonyms of other names when their genera are studied in detail.

Finally in this preamble it might be useful to comment briefly on the apparent affinities and zoogeographical relationships of the Australian Tachinidae. In the main the fauna consists of endemic genera and species occurring principally in the eastern and southern parts of the Australian continent and in Tasmania, but in northern Queensland and in the Northern Territory this essentially Australian fauna is supplemented by many Oriental genera and species that occur widely throughout South-East Asia and spread eastwards into Melanesia and northern Australia. There is thus a large shared element in the fauna between New Guinea and Queensland of forms that probably reached Australia by immigration from the north and west. In addition to this, however, there has perhaps been a contrary movement of characteristically Australian forms northwards into New Guinea (for recent collecting has now shown the presence of such typically 'Australian' genera as *Amphibolia*, *Chaetophthalmus* and *Tritaxys* in the central New Guinea highlands), unless the common elements between upland New Guinea and upland New South Wales are separated remnants from a formerly widespread distribution. A few species occurring in Australia are widespread throughout the Old World, and it seems likely that critical future work will show the presence in Australia of species having a circum-Indian Ocean distribution from eastern Africa through peninsular India and on to Western Australia or Queensland: some tachinid parasites, such as *Carcelia* species attacking *Heliothis*

cotton bollworms, masquerade under different names in different zoogeographical regions (just as their hosts often do) when almost certainly only a single species is involved. Between Australia and New Zealand there is almost no relationship at all in the tachinid fauna, that of New Zealand being a baffling and peculiar fauna very different from that of the rest of the Old World; the only notable point of resemblance between the Australian and New Zealand faunas is in the Phasiini, where the New Zealand 'genus' *Campbellia* suggests derivation from the Australian part of the *Alophora* (*Mormonomyia*) complex. Little can be said about any possible relationship between the Australian Tachinidae and those of South America beyond commenting that there is some resemblance in facies between forms in Tasmania (and nearby parts of the Australian mainland) and some forms in the southern Neotropical fauna; the significance of this resemblance is not clear.

All the main subfamilies and tribes of Tachinidae are represented in Australia, but the area is remarkable for the rich development of the Proseninae (=Dexiinae) and in particular of the Rutiliini (Crosskey, 1973). The abundance of forms in this tribe appears to be closely correlated with the richness in Australia of the chafer fauna (Scarabaeidae : Melolonthinae), which provides the hosts for these tachinids.

## PART I—KEYS TO THE SUPRASPECIFIC TAXA OF AUSTRALIAN TACHINIDAE

### INTRODUCTION

It is certain that the several hundred species of Tachinidae known to occur in Australia represent only a small proportion of the fauna that will ultimately be discovered and (presumably) named. It is therefore premature, in a sense, to attempt to provide keys to the supraspecific taxa, especially when experience shows that even with a well-known fauna like the Tachinidae of Britain it is difficult to construct really satisfactory keys that anyone but a specialist can use reliably. Yet in attempting to acquire a knowledge of a large and complex insect fauna like the Tachinidae of Australia the potential student is in need of some keys that at least begin to organize the mass of data available and to show how the many described genera can be differentiated, and how the higher taxa to which they belong can best be recognized.

Scarcely any keys to the Australian fauna have up to now been available. Malloch (various papers) published small piecemeal keys to place some of his newly described taxa among their relatives, and one or two longer keys for the recognition of artificial groups of genera, but these have been of very limited use and are now outmoded by changes in generic concepts that have taken place during the past thirty years or so. Apart from these, the only keys published to any Australian supraspecific taxa have been restricted to the Rutiliini (Paramonov, 1968; Crosskey, 1973).

None of these pre-existing keys is of any use in providing the would-be student of the Australian fauna with an over-all system of keys that will provide a means of identifying the many tribes and genera to be found on the Australian continent. The object of these keys here presented is to provide just such a system, so that

the worker interested in taking up this group has some means at hand for beginning on a study of the Tachinidae without necessarily having immediate access to a large museum collection: to aid the student as much as possible a detailed glossary is given of all the main terms used in the keys.

The Tachinidae is a taxonomically very difficult family, as Colless & McAlpine (1970) have emphasized in their account of the Australian Diptera, and it is notoriously difficult to make keys that are free from all possibility of error when identifying specimens. Specialists on the family frequently find difficulty in using keys, and not infrequently make errors of identification in spite of their knowledge of the family; these points are emphasized, so that the beginner on the group shall not feel too discouraged when keys appear to fail (as they will occasionally, since much of the fauna remains unknown) or when the specimen that ran out so convincingly to a certain name proves to be something quite different.

#### MATERIAL AND METHODS

The keys and diagnostic matter are mainly based on a study of material in the British Museum (Natural History), London, together with a study of types (especially those of the type-species of Australian genera) from the collections in Berlin, Canberra, Eberswalde, Ottawa, Paris, Vienna and Washington. The BMNH collection is the largest and most representative of world Tachinidae, and, except for the Australian National Insect Collection, is richer in material from Australia than other collections.

With few exceptions the early stages of Australian Tachinidae remain completely unknown and the keys are, perforce, based only on adult characters. For describing these the following conventions and abbreviations are used.

In describing the positions of leg setae the convention is followed of imagining the leg to be extended at a right-angle to the longitudinal axis of the fly, when:

<i>a</i>	anterior	<i>p</i>	posterior
<i>ad</i>	anterodorsal	<i>pd</i>	posterodorsal
<i>av</i>	anteroventral	<i>pv</i>	posteroventral
<i>d</i>	dorsal	<i>v</i>	ventral

*A tibial seta indicated by any of these letters is on the shaft of the tibia and not at its end unless otherwise specified.*

The abbreviations used for thoracic setae are:

<i>acr</i>	acrostichal	<i>pra</i>	pre-alar
<i>dc</i>	dorsocentral	<i>prst acr</i>	presutural acrostichal
<i>ia</i>	intra-alar	<i>prst dc</i>	presutural dorsocentral
<i>ph</i>	posthumeral	<i>prst ia</i>	presutural intra-alar
<i>post acr</i>	postsutural acrostichal	<i>sa</i>	supra-alar
<i>post dc</i>	postsutural dorsocentral	<i>stpl</i>	sternopleural
<i>post ia</i>	postsutural intra-alar		

Abdominal tergites are indicated by the letter T followed by the appropriate number; the composite first apparent tergite is  $T_1 + 2$ , the usual last visible tergite  $T_5$ . Abdominal sternites are indicated by the letters St suffixed as for tergites (only the male  $St_5$  generally requires citation).

Parts of the male hypopygium are infrequently cited in the keys, but the terminology used by Colless & McAlpine (1970) is used throughout the paper whenever genital features are mentioned.

All keys are regularly dichotomous. The keys include names of a few genera that are not yet positively known from Australia but seem likely to be found there: in such cases the names are printed in non-bold type. Where a generic name is included in square brackets in the keys it indicates that the tribal position of the genus concerned is uncertain, but that the genus is included in a different tribe in the formal classification adopted from the one to which the key relates.

Figures have all been drawn personally and attempt to show only the essentials required for identification (needless shading and vestiture have been omitted). An attempt has been made to illustrate basic patterns of chaetotaxy (see Text-figs 4, 7 & 54-63) on the thorax by omitting the bristles themselves and indicating their distribution just by the 'pore-patterns' of their insertions. Such a method of illustrating chaetotaxy seems hardly to have been used at all in tachinid taxonomy but provides a useful visual aid for recollecting the most fundamental and frequently recurring patterns. It must be emphasized that the circles indicating the bristle pores are exaggerated in size relative to the sclerites, but that different sized circles are used to show (approximately) the relative sizes of the bristles to each other. Broken lines between circles indicate the serially arranged setae that have the same composite terminology.

#### AN ANNOTATED GLOSSARY OF CHARACTERS AND TERMS USED IN THE KEYS

The glossary here given summarizes the terminology used in the keys, so as to make these as comprehensible as possible to the non-specialist (including in particular the Australian student who might wish to take up tachinid taxonomy). Hardly any of the recent works – and very few old works – contain any glossary of the terms habitually used by taxonomists working on the Tachinidae, and the glossary here presented ought (it is hoped) to be of benefit to my specialist colleagues in so far as it attempts to define the external adult characters most often used in supraspecific taxonomy and to correlate the various synonymic terms most commonly used by different authors.

The terminology adopted is that which appears to be the most universally accepted, and most readily comprehended, by specialists. It is, however, essentially a taxonomist's vocabulary, and some of the terms are at variance with those favoured by the morphologist. This point is specially germane when dealing with the Australian fauna, as Colless & McAlpine (1970) in their work on the Australian Diptera have adopted a strongly morphological line for their structural terminology, and there are therefore some discrepancies between the taxonomic terminology and that of Colless & McAlpine; in particular this affects the names

of parts of the thorax and of certain wing veins. Some of the terminology used by Colless & McAlpine is helpful for the taxonomist, especially their terms *pleurotergite* and *mediotergite* for parts of the thorax that have not had satisfactory names in the taxonomic literature, and these terms are here adopted (as *pleurotergite*, for example, is a much handier name than the usual *supra-spiracular convexity* of the taxonomist); on the other hand it is disadvantageous in taxonomy to have to speak of the *posterior pronota* and in this case I prefer the time-honoured taxonomic term *humeral calli*. In regard to the nomenclature of wing veins I continue to follow the standard work on Tachinidae by Mesnil (1944) in preference to the venational notation found in most of the more generalized works on Diptera (including that of Colless & McAlpine); the main difference between these systems that is of practical importance concerns the so-called fifth vein which Mesnil (here followed) calls  $Cu_1$  and which is known as  $M_{3+4}$  in other works (e.g. Colless & McAlpine, 1970).

The existence of many alternative names for different structures has made it necessary to record the more important or frequent alternatives, and this has been done in the glossary by entering the alternative name(s) when needed (italicized and in parentheses) at the end of each definition. The alternatives should be helpful in correlating the present work with that of other authors (for example, by showing that the structures here termed *parafrontals* are those often known as *orbits*). In some instances the German equivalents have been given so that the English terminology used in keys can be readily associated with the German terminology used in Mesnil's very important work on Tachinidae in Lindner's *Die Fliegen der Palaearktischen Region* 64g (which contains keys of great value on a world basis as well as for the local Palaearctic fauna).

Many of the glossary definitions are accompanied by separately paragraphed annotations that are designed to show, very briefly, the taxonomic value of the characters for which the terms stand. In these notes examples are often cited of particular genera or higher taxa in which a certain character condition occurs: the examples are drawn from the Australian tachinid fauna, but most of them are relevant to other zoogeographical regions as well. *The annotations apply only to Tachinidae and must not be read as applicable to other Diptera.*

The accompanying Text-figures 1-23 have been specially prepared to illustrate the characters mentioned in the keys and as an adjunct to the glossary definitions.

**abdominal T1 + 2.** The apparent first segment of the abdomen, formed compositely of fused first and second tergites (loosely, *first segment*) (Text-figs 91 & 94).

**acrostichal setae.** The innermost two longitudinal rows of setae on the mesonotum (Text-fig. 4).

These may be absent or reduced (e.g. in some Phasiini, Minthoini) or represented by only the prescutellar pair.

**antennal axis.** An imagined horizontal line through the head profile at the level of the antennal insertions (Text-fig. 14).

The height of the axis relative to the eye centre and the head length at this axis in relation to head length at the epistomal axis can be significant in describing head form.

**apical scutellar setae.** The hindmost pair of marginal setae on the scutellum (except when undeveloped) (Text-figs 5 & 6).

Orientation of these setae (whether horizontal or upright, crossing or diverging) can be taxonomically important. If the apical setae are unrepresented then other marginal setae are the hindmost ones in a literal sense.

**appendiculate.** Provided with an  $M_2$  appendix (q.v.) (said of vein  $M$ ).

**appendix.** A spur-like vein of varied length that continues almost directly towards the wing margin from the bend of vein  $M$  (designated  $M_2$ ) (Text-fig. 10).

Normally present only when vein  $M$  is abruptly angled and sometimes represented only by a weak vestige or even a mere fold in the wing membrane.

**arista.** The setiform or style-like part of the antenna arising externally from the base of the third antennal segment (German: *Fühlerborste*) (Text-fig. 1).

Present in all Tachinidae and providing useful taxonomic features in hair length, extent of thickening, and elongation of the two basal segments. Typically it is micropubescent (with very inconspicuous hairing that is shorter than its own diameter) or pubescent (with more conspicuous longer hair that does not or only slightly exceeds its own diameter), but may be plumose (with long hairs that greatly exceed in length its own diameter and give the arista an obvious bushiness). Micropubescent or pubescent in all Phasiinae and nearly all Goniinae, often plumose in Proseninae and Tachininae (especially Minthoini).

**barette.** A small subrectangular area on the pleural region of the thorax differentiated between the pteropleuron and the hypopleuron (meropleuron) (Text-fig. 7).

Of minor taxonomic importance in the extent of its hairing. Usually a few hairs only on anterior part but commonly bare, less often fully haired along its length (e.g. in most Rutiliini, *Winthemia*).

**basal node of  $R_{4+5}$ .** The slightly or strongly swollen basal part of wing vein  $R_{4+5}$  near its bifurcation from vein  $R_{2+3}$  (Text-fig. 10).

Usually bearing one more more small hairs or setulae on the upper surface (usually also on lower surface), sometimes totally bare (e.g. in many Phasiini, a few Blondeliini and Leskiini). Presence of only one very strong setula (e.g. in *Palexorista* and allied Sturmiini, many Neaerini and Acemyini) in contrast to several small hairs is often taxonomically important.

**basal scutellar setae.** The pair of marginal setae nearest to the scutellar base (except when, very rarely, undeveloped) (Text-figs 5 & 6).

The most constantly present pair of scutellar marginal setae throughout the Tachinidae, unrepresented in a *very* few forms (e.g. some Minthoini).

**basicosta.** The small sclerite anteriorly at the wing base between the tegula and the base of the costa (*subepaulet*).

The colour (whether clear yellow or orange instead of blackish brown) of this sclerite is of minor taxonomic value in different parts of the family.

**bend of vein  $M$ .** The forward curvature or angulation of the median vein ( $M$ ) where the bifurcation of  $M_1$  and  $M_2$  occurs, or if there is no bifurcation then the part of  $M$  where a forward change in its general direction occurs before it attains the wing margin (*cubitus*) (Text-figs 10 & 11).

The nature of the bend can be of great taxonomic importance (e.g. in differentiating the Blondeliini with an open gently curving bend from the Exoristini with a sharply angulate bend). A few Tachinidae lack the apical part of the vein (i.e.  $M_1$ ) and there is therefore no bend, and some very rare aberrant forms have only a very slight forward inclination of  $M$ .

**cell  $R_5$ .** The wing cell distal to cross-vein  $r-m$  and enclosed by vein  $R_{4+5}$  anteriorly and veins  $M$  and  $M_1$  posteriorly (*apical cell*) (Text-figs 10 & 11).

An important taxonomic character is provided by this cell and its associated venation according to whether it is 'open' or 'closed'. If the veins  $R_{4+5}$  and  $M_1$  reach the wing margin separately from each other then cell  $R_5$  reaches to the wing edge (Text-fig. 10) and is *open*; but when veins  $R_{4+5}$  and  $M_1$  coalesce and form a short common stalk ('petiole') before reaching the wing margin the cell is isolated from the edge of the wing and is *closed* (Text-fig. 11). In the latter case the cell is described as 'petiolate' (prefixed 'long-' or 'short-' if desirable). Intermediate forms occur in which the cell is closed just at the wing margin.

The cell is open in the vast majority of Goniinae, Tachininae and Proseninae, but is commonly closed and long-petiolate in Phasiinae (e.g. *Alophora*, *Cylindromyia*, *Leucostoma*, *Euthera*).

**cerci.** The inner median pair of articulated processes attached to the epandrium of the male hypopygium (*mesolobes*, *inner forceps*, *anal forceps*) (Text-fig. 21).

Conformation and degree of fusion of the cerci have some taxonomic importance, but relatively little at supraspecific level.

**costa.** The strong vein forming the fore margin of the wing.

**costal sector.** A segment of the costal length between any two successive veins that end at the costa.

**costal spine.** A short strong seta on the costa at the apex of vein  $Sc$ , inserted immediately before the costal 'break'.

Usually undeveloped or very inconspicuous, if strong then normally not exceeding  $r-m$  in length. Taxonomic value mainly at specific level.

**cross-vein  $m-cu$ .** The most distal wing vein connecting veins  $M$  and  $Cu_1$  (*posterior cross-vein*, *hind cross-vein*, *m-m*,  $M_3$ ) (Text-figs 10 & 11).

The position at which  $m-cu$  joins  $M$  (whether mid-way between  $r-m$  and the bend or nearer to the latter than the former) and the obliqueness of the vein have some taxonomic importance (e.g. in Voriini the cross-vein is exceptionally oblique in relation to the long veins and the wing in this tribe has a distinctive appearance on this account).

**cross-vein  $r-m$ .** The very short length of vein connecting veins  $R_{4+5}$  and  $M_1$  and closing cell  $R_5$  at its base (*anterior cross-vein*,  $R_6$ ) (Text-fig. 10).

In itself of no taxonomic use but a reference point for determining length proportions on the long veins.

**discal setae.** Setae standing medially or submedially on a specified surface (e.g. scutellum or abdominal tergites).

Most often used with reference to strong erect setae standing centrally on one or more of the abdominal tergites (the *MD* of Townsend).

**distiphallus.** The apical part of the aedeagus of the male genitalia (*phallus*, *aedeagus*, *preputium*) (Text-figs 22 & 23).

Of considerable taxonomic importance at various levels because of its diversity of form. Sometimes bizarrely developed in whip-like or coiled form.

**divaricate.** Directed outwards from one another.

Used in particular of the ocellar setae when these curve neither forwards (proclinate) nor backwards (reclinate) but curve outwards from each other towards the eyes (e.g. in *Paragonia*).

**dorsocentral setae.** The two longitudinal rows of setae on the mesonotum outside of the acrostichal setae (*presutural* + *postsutural* setae of Townsend) (Text-fig. 4).

Typically these are the strongest and most stable of the mesonotal setae (excluding the presutural seta and the first supra-alar), but are weak or variable in a few groups (notably Phasiini and Rutiliini). The number of dorsocentral setae forming the presutural and postsutural complement is of great taxonomic importance, particularly in the Goniinae. Many genera and tribes are completely constant in their *dc* complement (e.g. all Sturmiini have 3 + 4 *dc* setae).

**epandrium.** The large curved plate of the male hypopygium that bears the cerci and surstyli and is morphologically the ninth tergite (*TGIX*) (Text-fig. 23).

Apparently well developed in all Tachinidae but of limited taxonomic use except for slight modifications in its vestiture.

**epistomal axis.** An imagined horizontal line through the head profile at the level of the epistomal margin (*oral margin axis*) (Text-fig. 14).

Head length at the epistomal axis in relation to length elsewhere (e.g. at the antennal axis) can be significant in describing head form.

**epistomal margin.** The anteroventral edge of the epistome (*oral margin*).

**epistome.** The lower anterior part of the head below the face and between the vibrissae (*epistoma*) (Text-figs 1, 2 & 12).

The development of the epistome is taxonomically important. Often there is no epistome clearly differentiated from the face (e.g. Minthoini, Nemoraeni), but in many forms there is a strongly developed epistome which curves forwards from face and is easily visible in front of the vibrissal insertions when viewed in profile (e.g. in many *Alophora*, most Rutiliini, *Chaetophthalmus*). In the Tachininae the presence of a prominently projecting epistome (visible in profile) or a flat epistome (invisible in profile) provides a very important key character separating groups of tribes. When the epistome is prominent its margin is usually well below the level of the vibrissal insertions, and when exceptionally pointed and projecting is usually referred to as subnasute.

**erect.** Standing upright in relation to the surface (said of hair or setae to contrast their orientation with others that lie down) (cf. recumbent).

**excavate.** With a depression (said of abdominal *T1* + 2).

The extent of the median dorsal depression of abdominal *T1* + 2 is of great

taxonomic importance at several levels in different parts of the family. Often the depression extends backwards to reach the end of the segment, in which case  $T_1 + 2$  is described as 'excavate to its hind margin', but in many forms the depression clearly falls short of the hind margin or there is virtually no depression at all (e.g. many Phasiinae, Doleschallini). When  $T_1 + 2$  is excavate to its hind margin this condition often holds true of all the members of a tribe (e.g. all Rutiliini, all Sturmiini); in other tribes (e.g. Blondeliini) the tergite may be excavate to its hind margin in some genera but not others. In many Prosenini the excavation is rather deep and narrow and the sides of  $T_1 + 2$  are rather strongly humped.

**face.** The anteromedian surface of the head below the antennae and between the facial ridges (*clypeus* of Townsend) (Text-fig. 2).

**facial carina.** A strong median vertical ridge on the face separating the antennae (*facial keel*) (Text-fig. 12).

The presence or absence of a facial carina, and its form when present, provide important key characters for recognition of some forms. In most Tachinidae the face is flat or only weakly raised medially, but a large facial carina is present in many Proseninae (*Prosenia*, *Senostoma*, *Billaea* and all Rutiliini). When a carina is present it is typically flattened or convex on its anterior surface, or prominently bulbous on its upper part and contracting to a sharper ridge towards the lower end, but a sharp roof-like carina occurs in *Euthera*. A true facial carina is absent in Tachininae and Goniinae, but a weak swelling may be present below and between the antennal bases (e.g. in *Macrochloria*).

**facial profile.** The anterior outline of the head between the antennal base and the epistome when viewed in profile.

**facial region.** The face, facial ridges and parafacials collectively.

**facial ridges.** The flattened or raised strips differentiated on each side of the face that separate it from the parafacials (*facialia*) (Text-fig. 2).

These are of great importance in taxonomy because of their variously modified form (whether ridge-like lateral margins to the sunken face or flattened and in the plane of the face), the extent of their visibility when the head is viewed in profile, and the extent to which they bear hair or setae. In many aberrant forms (e.g. *Therobia*, *Myiotrixia*) they are widened and flattened ventrally and extensively haired, but typically they are at least slightly ridge-like and have at least a few setulae immediately above the vibrissae (which in normal forms demarcate the ventral ends of the ridges); in many genera of Tachininae and Goniinae the ridges bear strong downcurved setae or setulae on most of their height.

**fascia.** A transverse band on the dorsum of thorax or abdomen.

**frons.** The anterodorsal region of the head bounded by the eyes laterally and extending from the ocellar triangle to the lunula; the interfrontal area and the parafrontals collectively.

Typically the frons is well developed in both sexes, though usually narrower in the male than the female, but is strongly reduced in some forms in which the head is holoptic or almost so (e.g. in males of many *Formosia*, Ormiini and

Palpostomatini or in both sexes of many Phasiini). The frons is of equal width in both sexes in all Siphonini and many Phasiinae, but rarely in other groups.

**frontal setae.** The setae of the paired rows of setae standing on the inner edges of the parafrontals (*Stirnborsten* of Mesnil) (Text-fig. 3).

These setae are strongly or moderately developed in most Tachinidae but may be weak and hair-like in Rutiliini and Phasiini and occasionally in other groups. The rows may be partially obliterated in forms with holoptic or semi-holoptic heads. Normally the setae of each row are directed inwards so they cross medially (cruciate frontals), but in a few forms some or all of the frontal setae are directed upwards and backwards (reclinate frontals). In Phasiinae and Proseninae the rows of frontal setae extend downwards only to the level of the antennal base or but slightly beyond, but in most Tachininae and Goniinae the rows reach downwards at least to the level of the middle of the second antennal segment and often beyond (in the latter case the rows extend well down on the parafacials where, particularly in males, they may be irregularly doubled, e.g. in *Voriella*).

**gena.** The lateroventral part of the head between the bottom of the eye and the peristome or oral cavity (*cheek, jowl, peristom* of Mesnil) (Text-fig. 1).

The depth of the gena from the lowest point of the eye to the ventral margin of the head when seen in profile can provide an important character, especially its proportion in relation to eye height or width of the profrons (e.g. much narrower in Carceliini than in other tribes of Goniinae).

**genal dilation.** The swollen haired part of the gena continuous with the postbuccae and occiput (*Occipitale Erweiterung auf dem Peristom* of Mesnil) (Text-fig. 2).

Commonly the genal dilation occupies most of the gena and reaches well forwards towards the vibrissal angles, but in some forms is reduced or virtually absent (in which case the gena is bare or mainly so). The genal dilation is normally extensively haired and sometimes bears a few stronger setae.

**hair fascicles.** Dense, often convergent, tufts of hair on the abdominal venter.

These are a secondary sexual character of males and occur mainly in a few genera of Goniinae. When present they are normally restricted to the venter or sides and venter of the fourth tergite (e.g. *Palexorista*) or of the fifth tergite (e.g. *Paropsivora*, *Zosteromeigenia*), but occasionally are present on two successive tergites.

**humeral calli.** The paired convexities forming the anterolateral corners of the thoracic dorsum (*humeri, posterior pronota, shoulders*) (Text-fig. 4).

**humeral setae.** The setae standing on the humeral calli (Text-fig. 4).

The number and arrangement of these setae, particularly whether the main ones stand in a straight line across the callus or in a triangle, is taxonomically important at several levels. Usually each callus bears at least two differentiated humeral setae, but there may be only one or even no clearly differentiated seta (e.g. in Phasiini).

**infrascapular hairs.** A group of minute hairs or setulae on the mediotergite adjacent to the base of the lower calypter (Text-fig. 7).

Presence or absence of these hairs is sometimes a useful minor taxonomic

character (but great care is often needed in examining them as they are easily overlooked). They occur haphazardly in various genera in all the subfamilies but are of rare occurrence in Goniinae (mainly confined to some Blondeliini) and Proseninae (but occurring at least in some *Chetogaster*).

**inner vertical setae.** The main pair of erect setae standing on the summit of the vertex (*Innere Stirnborsten* of Mesnil) (Text-fig. 3).

This pair of setae is almost universally present in Tachinidae, though it is sometimes weak and hair-like in Phasiinae and some aberrant tribes. The two setae are most often subparallel to each other but are sometimes directed inwards and crossed, especially in some Tachininae. Subparallel inner verticals are the rule in Goniinae though genera with cruciate inner verticals occur (e.g. *Phorocerosoma*).

**interfrontal area.** The median area of the frons between the parafrontals (*interfrontalia*, *frontalia*, *frontal vitta*, *Stirnstreifen* of Mesnil) (Text-fig. 2).

In forms in which the head is holoptic or the eyes strongly approximated the interfrontal area is extensively obliterated and the parafrontals meet in part in the mid line of the frons.

**intermediate abdominal tergites.** The middle two of the apparent four main abdominal segments when seen from above, i.e. tergites 3 and 4 collectively.

**intra-alar setae.** The setae of the mesonotum standing external to the dorso-central setae and approximately in line with the middle of the postalar callus (Text-fig. 4).

The number and arrangement of these setae are of great taxonomic importance. The most complete complement (excluding the occasional haphazard supernumerary) is  $1 + 3$  *ia* setae and is found in the great majority of Goniinae. The presutural intra-alar is most often absent in the other subfamilies but is present, for example, in Voriini and Campylochetini (which have a  $1 + 3$  *ia* complement like most Goniinae) and sometimes elsewhere. Many Phasiinae and a few Tachininae have two strong posterior intra-alars that are widely spaced with the anterior one close to the transverse suture, e.g. *Leucostoma*, *Cylindromyia*, *Zita*, *Leverella*; this arrangement of two *post ia* is fundamentally different from that found in forms normally possessing three but occasionally lacking the anterior one (in which case the two remaining *post ia* stand near each other and the front one is remote from the transverse suture). A few forms completely lack intra-alar setae (e.g. some Phasiini and Ormiini) or they may be missing in isolated specimens of species normally possessing at least one. In *Cylindromyia* the anterior one of the two *post ia* is enormously strong and stands out of alignment with the hind one and unusually close to the pre-alar seta.

**last section of  $Cu_1$ .** The part of vein  $Cu_1$  between its junction with *m-cu* and its apex at the wing margin.

**lateral scutellar setae.** One or more pairs of marginal scutellar setae standing between the basal and subapical or apical pairs (Text-fig. 5).

These setae are frequently absent, and when present are usually weaker than the basals and subapicals.

**lower calypter.** The larger ventral one of the pair of membranous lobes at the wing base rigidly attached at its base to the suprasquamal ridge (*squama*, *thoracic squama*, *Thorakalschüppchen* of Mesnil).

Taxonomic characters of the lower calypter lie in its shape and vestiture, and at specific level in colour. It is well developed in all Tachinidae, and in some is grossly enlarged (e.g. in an undescribed Leucostomatine from Madagascar the lower calyptres of the male are so enormous that they completely hide the abdomen). In some forms (e.g. Palpostomatini) the lower calypter is subcircular posteriorly and diverges from the scutellum but in many it is very broad posteriorly and its inner edge abuts close to the scutellum (e.g. Sturmiini and many other Goniinae, many Phasiini). In a few Goniinae (Ethillini, some Winthemiini, some *Carcelia*) the outer edge of the lower calypter is bent abruptly downwards. Normally the upper surface is bare but fine erect hairing is present in a few forms and provides a useful key character (e.g. *Nemoraea*, some *Senostoma*, some *Rutilia* (*Chrysorutilia*)).

**lunula.** The crescentic sclerite between the antennal bases and the frons (*frontal lunule*) (Text-fig. 2).

Useful as a descriptive landmark, but otherwise of little value. Bare in all Tachinidae.

**marginal scutellar setae.** The strong setae around the edge of the scutellum collectively.

The total number of pairs of these setae can provide a useful key character. In a few forms the marginal setae are more numerous than usual, slightly or strongly spiniform, and not clearly differentiated into basals, laterals and subapicals (e.g. *Formosia*, *Rutilia*).

**median marginal setae.** Setae standing on the middle part of the hind margin of an abdominal tergite (the *MM* of Townsend).

**mediotergite.** The posterodorsal declivity of the thorax below the postscutellum and between the halteres (*lateral postscutellar plates* + *basiscutellum* of Townsend) (Text-fig. 7).

Not used in taxonomy except for presence or absence of fine hairs on the mediotergite near the base of the lower calypter (infrasquamal hairs, q.v.). Shape might have taxonomic value but has been insufficiently investigated. In some forms the middle part immediately ventral to the postscutellum (i.e. the *basiscutellum* of Townsend) is differentiated by a distinct line on each side from the lateral parts (i.e. the *lateral postscutellar plates* of Townsend), but in others (e.g. *Doleschalla*) there is little sign of such differentiation.

**mentum.** The sclerotized shaft or main plate of the proboscis (figs 12 & 13 in Crosskey, 1973).

Length and shape of the mentum of the proboscis have some taxonomic use, e.g. in Rutiliini in which the mentum in some forms seen in profile is distinctly tapering while in others it is parallel-sided.

**mesonotum.** The prescutum and scutum together (Text-fig. 4).

Markings of the mesonotum when present, e.g. vittae or spot-patterns, have some taxonomic usefulness. Strictly, the mesonotum is formed of a scutum

subdivided by the transverse suture, but the terms prescutum and scutum remain useful in taxonomy.

**mesopleuron.** The upper anterior part of the wall of the thorax between the anterior spiracle and the wing base (*anepisternite*) (Text-fig. 7).

Of little use taxonomically. Presence or absence of a dense pollinose spot on the centre of the mesopleuron is occasionally useful at specific level (e.g. in Rutiliini). A small anterodorsal mesopleural seta may be developed but is little used taxonomically.

**notopleuron.** A small subtriangular area differentiated laterodorsally on the thorax between the humeral callus and the wing base and external to the prescutum (Text-figs 4 & 7).

Of very little use in taxonomy except as a minor aid in distinguishing between a few Proseninae. In Doleschallini the notopleura are not noticeably differentiated from the prescutum, and in a few Rutiliini (e.g. subgenus *Neorutilia*) the posterior part of the notopleuron is unusually swollen and knob-like.

**notopleural setae.** The setae standing on the notopleuron (Text-fig. 4).

In very nearly all Tachinidae these number two, one anterior and one posterior. Rarely additional setae are developed, e.g. in the Philippines species of *Rutilia* (*Chrysorutilia*) in which the posterior knob-like swelling of the notopleuron bears two strong setae (in place of the usual single posterior notopleural).

**occiput.** The posterior surface of the head excluding the postorbits (*Hinterkopf* of Mesnil) (Text-fig. 1).

**occipital setulae.** Recumbent *black* setulae or strong hairs on the upper occiput behind the postocular row (*schwarzen Mikrochäten hinter den Postokularbörschen* of Mesnil).

Presence or absence of these setulae is often a useful taxonomic character at various levels.

**ocellar setae.** The pair of setae standing very near the ocelli on the ocellar triangle or tubercle (Text-fig. 3).

Presence or absence, orientation, and occasionally the precise position of the insertions relative to the ocelli are of taxonomic value and provide useful key characters. When present the setae are most often curved forwards and downwards (proclinate ocellars), but occasionally backwards (reclinate ocellars) (e.g. in *Gonia*, *Elpe*, *Leucostoma*); in a few forms they curve directly outwards towards the eyes (divaricate ocellars) (e.g. in *Paragonia*).

**ocellar triangle.** The subtriangular area of the vertex on which the ocelli are placed (*ocellar plate*, *vertical triangle*, *ocellarium*) (Text-fig. 2).

Typically the ocellar triangle is slightly raised in relation to the rest of the vertex, and in forms with holoptic or subholoptic heads the ocelli are on a very prominent *ocellar tubercle* (e.g. most male *Palpostoma*). Ocelli are almost universally present in Tachinidae, but are vestigial or absent in some Ormiini (e.g. *Therobia*).

**outer vertical setae.** A pair of outwardly curved setae standing laterally on the vertex close to the eyes (Text-fig. 3).

These setae are weak or absent in many forms, and when present are usually only strong in females. They are present in females of Goniinae, but usually absent or represented by mere hairs in males (in the Siphonini both sexes have strong outer verticals).

**palpi.** The paired forwardly directed appendages of the proboscis arising between the base of the mentum and the oral cavity.

Presence or absence of palpi, and shape and size when present, often provide useful key characters. Palpi are usually present (virtually always in Goniinae) but may be totally absent as in *Cylindromyia* or vestigial (e.g. *Linnaemya*, *Chaetophthalmus*, some *Stomatomyia*). Exceptional development sometimes occurs in which the palpi project far beyond the epistomal margin (e.g. *Exechopalpus*) or are greatly swollen and clubbed (e.g. females of *Rutilotrix*).

**parafacials.** The paired anteroventral areas of the head separating the eyes from the facial ridges and lying between the parafrontals and the genae (*parafacialia*, *Wangen* of Mesnil) (Text-figs 1 & 2).

These areas are taxonomically important for their vestiture and breadth in relation to, for instance, the width of the face or the antennae. Most often the parafacials are bare, but they may be haired to a varying extent or may carry strong bristles. In many forms the descending rows of frontal setae reach down on to the upper parts of the parafacials, *but these setae are discounted when the parafacials are described as bare* (in descriptive practice the 'parafacials' normally means those parts of them lying ventrally to the lowermost frontal setae).

**parafrontals.** The paired areas forming the outer parts of the frons and abutting against the eyes (*orbits*, *fronto-orbital areas*, *parafrontalia*) (Text-figs 1 & 2).

Normally the parafrontals are separated from each other by the interfrontal area, but in some forms they meet each other in the mid-line of the frons and partially or wholly obliterate the interfrontal area. Usually when they meet the head is holoptic or nearly so, but a very few forms with very broad frons have parafrontals that not only meet in the mid line but have lost most or all of the line of union so that the entire frons is formed of completely coalesced parafrontals (e.g. males of most *Heterometopia*). Hairing of the parafrontals can be of minor taxonomic usefulness at specific level.

**peristome.** The lower margin of the head around the buccal opening.

The term is used by Mesnil for the whole of the area here termed the gena.

**peristomal setae.** Lower marginal setae of the head standing on the peristome (Text-fig. 3).

**petiolate.** Provided with a petiole (q.v.) (said of wing cell  $R_5$ ).

**petiole.** The short length of wing vein formed by the union of the apices of veins  $R_{4+5}$  and  $M_1$  in wings in which cell  $R_5$  is closed before the wing margin. See under cell  $R_5$  above.

**pleurotergite.** The convex area of the side of the thorax lying above the hind spiracle and between the pteropleuron and the mediotergite (*squamopleuron*, *supra-spiracular convexity*).

This area is bare (i.e. has only a nap of microscopic pubescence) in nearly all

Tachinidae but has taxonomic importance as a taxonomic feature in a few forms in which it bears long dense hair (e.g. *Microtropesa* and *Paratropeza*).

**pollinose.** With a covering of pollinosity (q.v.).

**pollinosity.** A nap-like covering to any part of the body formed by closely aggregated ultramicroscopic pubescence.

The extent, density and colour of pollinosity can provide taxonomic characters and are largely responsible for the general appearance of many Tachinidae. Banded or spotted patterns are typically produced either by islands of dense pollinosity surrounded by less pollinose areas, or alternatively by non-pollinose islands in areas that are mainly thickly coated with pollinosity (e.g. the conspicuous spot patterns of *Amphibolia*). When pollinosity is not evident at normal magnifications of the entomological microscope (up to  $\times 100$  or  $\times 150$ ) or is very inconspicuous on any area then the area is said to be 'non-pollinose'. When the cuticle is dark, non-pollinose areas are typically metallic and the extent of metallic colour can be important taxonomically (e.g. in Rutiliini).

**postabdomen.** The part of the abdomen including the terminalia lying beyond segment 5 (the last segment normally readily visible).

In many forms much of the postabdomen is concealed and tergite 5 forms the end of the immediately visible abdomen. In some forms the postabdomen is more conspicuously developed than normal and may be distinctly recurved under the main part of the abdomen (preabdomen) (e.g. *Cylindromyiini*) and may bear elaborate modifications associated with oviposition (e.g. various forcipate processes in female Phasiinae).

**postalar calli.** The paired convexities forming the posterolateral corners of the thoracic dorsum (Text-figs 4 & 7).

**postalar setae.** The strong horizontal setae standing on the postalar calli (Text-fig. 4).

In nearly all Tachinidae there are two strong postalar setae, but in all Rutiliini there are three or more (sometimes as many as six or seven) strong postalars, the distinction between three, and four or more, being very important in taxonomy of the group. Outside of Rutiliini the development of a strong third postalar seta is rare (but occurs, e.g., in some *Microtropesa*). Rarely only a single strong postalar seta is developed (e.g. in some Phasiini).

**postalar wall.** The vertical declivity forming the outer surface of the postalar callus (Text-fig. 7).

This area is of taxonomic value in the Rutiliini where the postalar wall bears a dense tuft of hair in *Formosia* and *Formodexia* Crosskey that is absent in other genera. These genera appear to be the only forms represented in the Tachinidae with such hair (in all others the postalar wall is bare or at most has only one or two hairs on its extreme upper part immediately below the rounded haired outer lip of the callus).

**postbucca.** A vaguely defined area between the gena and the occiput forming the posteroventral corner of the head (*postgena*) (Text-fig. 1).

**posteroventral declivity of the thorax.** That part of the thorax lying between the base of the abdomen and the insertions of the hind coxae (Text-fig. 7).

In most Tachinidae the hind coxae are rather close to the abdominal base and the posteroventral declivity of the thorax consists of a median membranous area flanked by curved sclerotized areas (the metapleura). In a few forms (e.g. *Cylindromyia*, *Doleschalla*) the abdomen and the metacoxae are much more remote from each other than is usual and the entire posteroventral declivity of the thorax forms a fully sclerotized bridge between them; this forms an important taxonomic and key character.

**posthumeral setae.** One or more setae standing anterolaterally on the prescutum immediately behind the humeral callus (Text-fig. 4).

Development of these setae is rather variable and their taxonomic usefulness very limited. The *ph* setae are usually most strongly developed in Goniinae, in which two moderately strong posthumerals are normally present on each side, and least strongly represented in Phasiinae and Proseninae in which they may be absent or hair-like.

**postocular row.** The regular row of setulae or long hairs on the upper and outer edges of the occiput immediately behind the eyes (Text-fig. 3).

**postorbites.** The narrow laterodorsal strips of the head lying between the eyes and the postocular rows (Text-fig. 1).

**postscutellum.** The transverse swollen lobe below the scutellum and dorsal to the mediotergite (*subscutellum*, *infrascutellum*, *postnotum*) (Text-fig. 7).

This is almost universally present in Tachinidae and strongly convex. It is very weakly developed in a few forms (e.g. Palpostomatini) and is strongly produced backwards, squared and flattened in some Phasiini (e.g. *Campbellia*, *Alophora* subg. *Mormonomyia*). The postscutellum is always bare.

**postsutural.** Behind the transverse suture of the mesonotum.

**pre-alar seta.** A seta standing at the extreme anterolateral corner of the scutum anterior to, and approximately in line with, the supra-alar setae (*first supra-alar seta* of authors) (Text-fig. 4).

This seta is of the very greatest importance in tachinid taxonomy because of its variability in size, and, to a lesser extent, because of its presence or absence. The seta is universally present in the Goniinae (though it may be very weak) and may be either small (shorter than the first *post ia* seta or at most subequal to it) or very large (longer and stronger than the first *post ia* seta and usually also longer than the first *post dc* seta), and this distinction holds true almost without exception for the differentiation of two groups of Goniine tribes. In Phasiinae, Proseninae and most Tachininae the pre-alar seta is of the small type, and is sometimes absent (e.g. in Phasiini, some Minthoini and sometimes haphazardly in Proseninae).

**preapical (discal) scutellar setae.** A pair or more of recumbent or semi-recumbent setae standing on the scutellum in advance of the marginal setae (Text-fig. 5).

**prescutum.** That part of the mesonotum lying anterior to the transverse suture (Text-figs 4 & 7).

Morphologically this is the anterior part of a divided scutum but the term

remains useful in taxonomy. The prescutum as such has little use in taxonomy except for its patterning and pollinosity.

**presutural.** In front of the transverse suture of the mesonotum.

**presutural seta.** A single seta standing on the outermost part of the prescutum near the notopleuron and approximately in line with the pre-alar and supra-alar setae (*presupra-alar* seta of Townsend) (Text-fig. 4).

This is the most consistently stable and universally present thoracic seta in the Tachinidae, and on this account is not used in taxonomy. It is very nearly always present at least as a differentiated hair, and in the overwhelming majority of forms is an extremely strong seta even when other parts of the chaetotaxy are much reduced.

**prevertical setae.** A pair of outwardly directed setae standing on the upper ends of the parafrontals.

These setae occur mainly in females of certain Tachininae and are very rarely present in Goniinae (though found in some *Spoggosia* and *Baumhaueriina*, at least). They appear to represent a pair of orbital setae that curve outwards over the margins of the eyes instead of backwards towards the vertex (as is typical in orbital setae).

**proclinate.** Directed forwards, or forwards and downwards.

**proclinate orbital setae.** A pair or more of strong downwardly directed setae standing externally on the parafrontals near the eyes (*fronto-orbital setae*, *Äussere Orbitalborsten* of Mesnil) (Text-fig. 3).

These setae may be absent in both sexes, but typically two pairs are present in females and none in males. In some forms (e.g. all Siphonini) they are present in males as well as females. Occasionally a series of several (up to six or seven, rarely more) pairs may be present in both sexes (e.g. *Halydaia*, *Ceracia*).

**profrons.** A weakly defined area where the parafrontals and the parafacials meet (Text-figs 1 & 13).

Typically the area of the profrons is somewhat projecting and seen in profile is the widest part of the head that is visible anterior to the eye. The width of the profrons seen in profile in relation to the depth of the gena is occasionally a useful character.

**propleural seta.** A seta (sometimes duplicated) standing on the extreme anteroventral corner of the thorax (*Prästigmätikalborste* of Mesnil) (Text-fig. 7).

This seta, even if only hair-like, is differentiated in almost all Tachinidae and has very limited taxonomic use. It is totally absent in a few Goniinae (e.g. *Anacamptomyia*, *Euvespivora*, some *Carcelia* s.l. species), rarely elsewhere.

**propleuron.** The flattened area of the front edge of the thorax below the humeral callus (Text-fig. 7).

This area has considerable taxonomic importance and provides an easily seen key character according to whether it is bare (as is most often the case) or haired. The area never has strong setae. Hairing of the propleuron occurs sporadically throughout the Tachinidae, but particularly is present in all Rutiliini and many Tachininae (e.g. *Campylochetini*). In the Phasiinae the

propleuron is almost always bare, and in the Goniinae hairing of the propleuron is almost entirely confined to certain Blondeliini and Neaerini (the propleuron appears to be consistently bare in the tribes of Goniinae in which the pre-alar seta is very large).

**prosternal membrane.** The extensive membranous area on either side of the prosternum (Text-fig. 9).

This membrane is only of taxonomic value according to whether it is bare (as in the overwhelming majority of Tachinidae) or haired. Hairs on the prosternal membrane occur mainly in *Rutilia* subg. *Chrysorutilia* and a few allied Rutiliini, but elsewhere are of very rare occurrence (found, for example, in some *Chaetophthalmus* species).

**prosternum.** The strong ventral plate of the thorax lying between and in front of the fore coxae (Text-fig. 9).

One of the most important taxonomic characters in the Tachinidae is provided by the presence or absence of vestiture on the prosternum. The vestiture when present consists of fine hairs or a few strong setulae on each side of the middle part of the prosternum which are directed outwards or downwards, or of some soft hair on the anterior corners (as in some *Rutilia* and some *Chaetophthalmus* species). The prosternum is totally bare in (apparently) all Phasiinae, almost all Proseninae and the great majority of Tachininae, but is almost universally haired or setulose in the Goniinae (even if the vestiture consists only of a single hair on each side); a few Goniinae have the prosternum bare, these including several genera of Blondeliini and *Blepharella* in the Sturmiini.

**prostigmatic seta(e).** One or more strong setae anterolaterally on the thorax below the anterior spiracle (*mesopleurospiracular* setae of Townsend, *Substigmatikalborsten* of Mesnil) (Text-figs 7 & 8).

One or more of these setae almost always present and directed upwards. The genus *Peribaea* (tribe Siphonini) is very exceptional in having two equally strong prostigmatic setae of which the upper one is directed upwards and the lower one strongly downwards (an arrangement apparently found nowhere else in the family) (Text-fig. 8).

**pteropleural seta.** A seta standing on the upper edge of the pteropleuron (Text-fig. 7).

Presence or absence of this seta can provide an important character at various levels. Sometimes it is only weakly differentiated from the general pteropleural hairing and sometimes is duplicated. The seta is absent or very weak in nearly all Phasiinae and Proseninae and strong in nearly all Goniinae; in the Tachininae it is developed to various degrees in different genera or tribes, and if strong its actual size in relation to other structures is sometimes taxonomically useful (e.g. in African *Linnaemya*).

**pteropleuron.** The area of the side of the thorax immediately behind the mesopleuron and below the wing base (Text-fig. 7).

The only use of this area in taxonomy (apart from the pteropleural seta, q.v.) is for the extent of its hair vestiture. Normally the anterior half of the

pteropleuron (and sometimes much of the lower part) is bare but in a few taxa (e.g. the subgen. *Chrysorutilia*) the hairing extends further forwards of the pteropleuron than is usual.

**reclinate.** Directed backwards, or upwards and backwards.

**reclinate orbital setae.** One or more pairs of erect or backwardly directed setae standing on the upper parts of the parafrontals (Text-fig. 3).

The number of pairs of these setae can provide an important taxonomic feature, as in Sturmiini in which genera with one pair are rather sharply differentiated from genera with two or more. The setae are best differentiated in the Goniinae and some Tachininae, but may be absent in males of some forms though present in females (e.g. *Winthemia*) or may be very imprecisely differentiated from the rows of frontal setae. Reclinate orbital setae are absent or at least indefinite in Phasiinae and Proseninae. In genera in which males have a single pair of strong isolated reclinate orbitals the females may show two pairs, but have the lower pair weaker than the upper (main) pair and situated closer to each other.

**recumbent.** Lying down or appressed to the surface (said of hairs or setae to contrast their orientation with others that stand upright) (cf. erect).

**scutellum.** The large hemispherical or subtriangular lobe of the thoracic dorsum behind the scutum.

The shape and degree of flattening of the scutellum, and the nature of its hairing, provide minor taxonomic characters.

**scutum.** That part of the mesonotum lying posteriorly to the transverse suture (Text-figs 4 & 7).

Morphologically this is only the posterior part of a divided scutum but the term remains useful in taxonomy. The scutum as such has little use in taxonomy except for its patterning and pollinosity.

**second aristal segment.** The more distal one of the two basal segments of the arista.

This segment varies in its length (to a greater extent than the first aristal segment) and can provide a useful feature.

**second costal sector.** That segment of the costa lying between the apices of veins *Sc* and *R*<sub>1</sub> (Text-fig. 10).

The presence or absence of small fine recumbent hairs along the ventral surface of this costal sector provides a useful taxonomic and key character at various levels in different parts of the family. The hairs when present are additional to, and quite distinct from, the marginal costal setulae. Sometimes whole tribes have one condition or the other (e.g. second costal sector bare below in all Rutiliini or haired below in all Thelairini), but elsewhere the character may be generic only (e.g. in Blondeliini).

**seta, setula.** Not differentiated from each other on any absolute criterion, but *seta* generally reserved for any strong and obvious bristle forming a particular component of the formalized chaetotaxy, and *setula* for a small stiffened hair. Setulae are commonly serially arranged, as along the costal margin, down the facial ridges or in the postocular row.

**spiniform setae.** Those setae that are exceptionally thickened and spine-like and lack the even tapering from base to apex of typical setae.

These occur commonly in Rutiliini and Tachinini and to a lesser extent elsewhere (e.g. some on the scutellum of Goniini).

**sternite 5.** The deeply divided last visible abdominal sternite of the male (Text-fig. 20).

**sternites.** The sclerotized plates of the mid venter of the abdomen (Text-fig. 20).

The extent of exposure or concealment of the sternites by the ventral ends of the tergites can provide a useful taxonomic character. The sternites may be completely exposed in their surrounding membrane (as in many Phasiini) or completely concealed by overlapping of the tergites (as in Goniinae), and intermediate conditions occur in which the anterior sternites are mainly or fully concealed and the fifth sternite and part of the fourth exposed. Vestiture of the sternites is occasionally of minor taxonomic use.

**sternopleural setae.** Setae standing on the *upper* part of the sternopleuron (Text-fig. 7).

The number and arrangement of these provide very valuable characters. Rarely they are totally absent or only one (posterior) one is present, but typically there are two or three (arranged  $1 + 1$  or  $2 + 1$ ). Four or (very rarely) more occur in some Goniinae and a few Tachininae and the arrangement of these may be significant (e.g. a characteristic group of genera of Sturmiini has the sternopleurals constantly arranged  $2 + 2$ ). When three are present the size of the lowermost seta in relation to the others may be useful.

**sternopleuron.** The large lateroventral subtriangular area of the thorax between the fore and mid coxae and below the mesopleuron and pteropleuron (Text-fig. 7).

Normally important only for its vestiture and this has very limited taxonomic use. A characteristic row of fine regular recumbent hairs in front of the mid coxa is present in *Actia*, and the ventralmost hairing may be modified into strong spiniform setae.

**subapical scutellar setae.** The pair of setae inserted posterolaterally on the scutellar margin (Text-figs 5 & 6).

These setae, together with the basals, are the most universally present setae on the scutellum and typically are the strongest pair. Their distance apart from each other at the base in relation to the distance between the insertion of one subapical seta and the basal seta of the same side of the scutellum provides an important character. Also important is the direction of the subapicals, e.g. whether diverging from each other as in Blondeliini or converging and crossing at their tips (enclosing the apical setae) as in Siphonini and Neaerini.

**sublunular bulla.** A knob-like swelling between the antennal bases immediately below and continuous with the lunula.

This occurs mainly in Phasiini, where in *Alophora* and allied genera the bulla is often polished and shining.

**supra-alar area.** The outer edge of the scutum above the wing base.

**supra-alar setae.** The outermost setae standing on the scutum (*postsupraalar bristles* of Townsend), other than the pre-alar seta (Text-fig. 4).

These are normally two, one behind the other, with the anterior one very strong. The anterior one is, with the presutural seta, one of the most stable and universally present setae in the tachinid chaetotaxy. Sometimes one or two supernumerary supra-alar may be developed in addition to the normal two, or the posterior supra-alar may be absent or hair-like. The second or posterior *sa* seta is always present in Goniinae but is absent in such tribes as the Phasiini and Palpostomatini and often in Ormiini.

Some authors consider the pre-alar seta (*pra*) as the first of the supra-alar setae and number the others accordingly (e.g. the posterior supra-alar is then the third supra-alar), but this is an undesirably confusing terminology. When both the pre-alar and the posterior supra-alar are absent (as in Phasiini and Palpostomatini) the anterior supra-alar is the only seta present on the supra-alar area and therefore stands very conspicuous and isolated.

**suprasquamal ridge.** The weakly sclerotized area at the base of the postalar wall to which the lower calypter is attached marginally (*tympanic ridge* of Townsend) (Text-fig. 7).

This structure is taxonomically useful according to whether it is bare or haired. The suprasquamal ridge is bare in all Phasiinae and Goniinae, and in the Proseninae hairing is confined to the Rutiliine genera *Rutilia*, *Amphibolia* and *Chrysopasta*; the ridge is apparently bare in all Tachininae except *Servillia jakovlewii* (Portschinsky).

**surstyli.** The outer pair of articulated processes attached to the epandrium of the male hypopygium (*paralobes*, *outer forceps*, *tenth sternite lobes* of Townsend) (Text-figs 21 & 23).

The form of the surstyli is of great taxonomic value at specific level but they have relatively little taxonomic use at higher levels.

**tegula.** The small anterior sclerite at the extreme base of the wing before the basicosta (*epaulet*).

**tergites.** The main segmental plates of the abdomen forming almost the entire circumference of each segment.

The tergites are taxonomically important in so far as their individual and collective forms give shape to the abdomen and determine, for example, whether it is elongate subcylindrical as in *Cylindromyia* and *Doleschalla*, or rather broad and flattened as in many Phasiini and Rutiliini, or subovate as in the majority of forms. In the Goniinae the ventral ends of the tergites meet in the mid-line of the abdomen, but in many forms in the other subfamilies they do not meet each other and the sternites are then exposed. Lengths of the tergites relative to each other, special modifications such as the depression of T5 found in many Rutiliini or the keel-like form of the abdominal venter in some Blondeliini, and pollinosity and pattern on the tergites can all provide useful characters.

**third costal sector.** That sector of the costa lying between the apices of veins  $R_1$  and  $R_{2+3}$ .

**transverse suture.** An impressed line across the mesonotum dividing it into anterior and posterior parts (prescutum and scutum, q.v.) (Text-figs 4 & 7).

**upper calypter.** The smaller dorsal one of the pair of membranous lobes at the wing base (*alar squama*).

This has little use in taxonomy but is of note in *Prodiaphania* (tribe Rutiliini) in which, when the wings are closed, it is as long as or almost as long as the lower calypter. In other Tachinidae it is normally much shorter.

**venter.** The lower surface as a whole (especially of the abdomen).

**vertex.** The upper surface of the head between the eyes and around the ocellar triangle (Text-figs 1 & 2).

This area is precisely delimited laterally by the eyes but it is rather vaguely defined from the frons and occiput. The width of the vertex varies greatly according to how closely the eyes are approximated and is typically wider in females than males. The width when seen from above in relation to total head width provides important specific differences. When the head is fully holoptic (e.g. in some Palpostomatini) all that remains of the vertex is a prominent ocellar tubercle (see ocellar triangle).

**vestiture.** Setae and hairing collectively.

**vibrissae.** Paired setae inserted anteroventrally on the head at the lower ends of the facial ridges and directed forwards (Text-fig. 3).

Typically the vibrissae are extremely strong and curve forwards and inwards like a pair of tusks; often they are the strongest setae borne on the head. In some forms they are reduced and scarcely distinguishable from the peristomal setae (below them) or from the small setulae on the lower ends of the facial ridges (above them). Short stubby non-crossing vibrissae occur in some forms.

**vibrissal angles.** The corners of the head, typically rather prominent, on which the vibrissae stand (Text-fig. 1).

**vibrissal axis.** An imagined horizontal line through the head profile at the level of the vibrissal insertions (Text-fig. 14).

**vitta.** A longitudinal band or line on the dorsum of the thorax or abdomen.

**vittate.** Marked with vittae.

**wing venation.** The rigid veins that support the wing membrane collectively.

This provides many important taxonomic characters at several levels, according to the proportions shown by different vein lengths, the fusion or non-fusion apically of  $R_{4+5}$  and  $M_1$ , the position of the bend of vein  $M$  in relation to the wing margin, the evanescence of parts of veins (especially loss of  $M_1$ ), the positions at which long veins abut on the costa, and to whether certain veins reach or fail to reach the wing edge. In addition the extent and presence or absence of setulae on certain veins can provide useful characters. Setulae may occur on veins  $R_1$ ,  $R_{4+5}$ , or  $Cu_1$  but not on the other long veins and never on the cross-veins; they are usually more extensive when present on the upper surface of the wing but may occur ventrally also on  $R_1$  and  $R_{4+5}$  (especially on the node).

#### KEY TO AUSTRALIAN SUBFAMILIES OF TACHINIDAE

The satisfactory classification of the Tachinidae into subfamilies is a matter of great difficulty and specialists are still far from agreed on the number and scope

of the subfamilies that should be recognized and on the combinations of characters that should be used to define them. Most taxonomists currently recognize relatively few subfamilies (normally between four and six) but a large number of tribes, but none of these family-group taxa are susceptible of simple and unequivocal definition that will render their members immediately identifiable on straightforward key characters. The existence of many aberrant forms, and of much convergent evolution, compounds the classificatory difficulties still further and ensures that – view them how we may – it is simply impossible to define the subfamilies succinctly or to key them out (at least on the external morphology of the adults) with any precision. Undoubtedly, however, recent and continuing studies on the male genital structure, the female reproductive habit, the morphology of the larvae (especially the first instar larvae), and of the host relations, are doing much to enlighten specialists on the probable phyletic relationships, and hopefully this newly acquired data may lead to more concrete subfamilial definition in the course of time. Meanwhile, it is possible to recognize many of the members of the more distinctive subfamilies (Phasiinae, Goniinae) on their overall facies, even though it is extremely difficult to fix their characters in an unexceptionable way that is satisfactory for key construction, and a knowledge of the host relations of any tachinid parasite can be of immense value in placing its subfamilial identity – for example, any Australian tachinid with a host in the Hemiptera belongs in the Phasiinae.

In the present work four subfamilies are recognized, the Phasiinae, Proseninae (=Dexiinae), Tachininae and Goniinae, but it is freely admitted that the Tachininae in the sense here used is a heterogeneous assemblage of forms in which two or three distinct subfamilies ought probably to be acknowledged; but until a clearer picture of the interrelationships of the included forms emerges it remains useful to treat all the Australian tachinids that are clearly not either Phasiinae or Proseninae or Goniinae as constituting one subfamily (for which the name Tachininae is nomenclaturally correct).

With the difficulties in defining the subfamilies, and the confusing overlap in many of their characters, it is impossible to construct a workable key even to the small number of subfamilies here recognized that will permit each and every specimen to be placed unequivocally in a subfamily. The key that follows is only a *tentative guide* to the probable suprageneric grouping to which any specimen belongs. In order to keep the key short and simplified (without long confusing couplets that attempt to cover every exceptional or aberrant form) certain tribes have been run out individually and sometimes there is more than one exit for a particular subfamily. Some extremely poorly known forms of very uncertain subfamilial position (e.g. *Myiotrixia*, *Amphitropesa*, *Neximyia*) have been omitted from consideration, as to include them would so complicate the key as to negate much of its value. When the names of taxa are juxtaposed this does not imply close phyletic relationship.

- 1 Ocelli absent. Prosternal region grossly inflated, visible from side view. [*Probably parasites of Orthoptera*] . . . . . **Ormiini** (Tachininae, part) (p. 57)  
 – Ocelli present. Prosternal region normal, not visible in profile . . . . . 2

- 2 Face with a heavy facial carina extending from epistome to lunula between the antennae and convex, bulbous or flattened on much or all of its anterior surface (Text-fig. 12). Eyes bare. [*Parasites of Coleoptera*]. **PROSENINAE** (part) (p. 41)
- Face without such a facial carina, usually flat or sunken, if weakly carinate just below antennal bases (*Macrochloria*) then eyes haired, if bullate between antennal bases only (*Alophora*) then cell  $R_5$  long-petiolate (but *sharp* ridge-like facial carina on whole face present in *Eutherini*). . . . . 3
- 3 One supra-alar seta (Text-fig. 54). Pre-alar seta absent (except *Saralba*). Usually one *post ia* seta or none. Head often holoptic or almost so and upper eye facets often conspicuously enlarged. Eyes always bare . . . . . 4
- Two or more supra-alar setae (Text-figs 56-63) (hindmost sometimes weak, second may be absent in *Minthoini*). Pre-alar seta almost always present (sometimes hairlike). Normally two or three *post ia* setae. Head never fully holoptic and eye facets never greatly enlarged. Eyes bare or haired . . . . . 5
- 4 Lower calypter very broad, straight or concave on its hind margin. Prosternum bare. Labellae without palpiform processes. Not more than one *post ia* seta. [*Parasites of Hemiptera*]. . . . . **PHASIINAE** (part) (p. 29)
- Lower calypter subcircular posteriorly and strongly diverging from the scutellum. Prosternum on each side with a long seta directed downwards. Labellae usually with a distinct pair of palpiform processes. Normally two *post ia* setae. [*Parasites of Coleoptera*]. . . . . **Palpostomatini** (Tachininae, part) (p. 53)
- 5 Two *post ia* setae present standing widely apart from each other with the anterior one not far from the transverse suture, the setae either subequal in size or the *anterior* one enormous and much stronger than the posterior one (Text-figs 56 & 58). Either the hind coxae very widely separated from the abdominal base by a deep completely sclerotized bridge, or apex of ♀ abdomen with forceps-like processes, or both. Postabdomen usually strongly recurved under the preabdomen. Wing with cell  $R_5$  closed and long-petiolate (Text-figs 76 & 78). [*Parasites of Hemiptera*] **PHASIINAE** (part) (p. 29)
- Two or more (usually three) *post ia* setae present which increase in size towards the hindmost (Text-figs 57, 59-63), if only two are present then the anterior one far from the transverse suture (except in *Parerigonini* and in *Minthoxia* in which two widely spaced subequally strong *post ia* setae present, but then other characters not fitting). Hind coxae and abdominal base not very remote from each other, area between them membranous medially; end of ♀ abdomen never forcipate. Postabdomen not distinctly recurved under preabdomen. Wing with cell  $R_5$  usually open, a few exceptions (e.g. *Euthera*). [*Not parasites of Hemiptera, except probably Eutherini*] . . . . . 6
- 6 Wings with a pattern of incomplete transverse black bands (Text-fig. 77). Cell  $R_5$  with long petiole (Text-fig. 77). Face with a very prominent *sharp* median ridge up its whole height (Text-fig. 24). Antennae exceptionally long, their apices reaching beyond the epistomal margin. [*Probably parasites of Hemiptera, no Australian records*] . . . . . **Eutherini** (Phasiinae, part) (p. 39)
- Wings without any bold black pattern. Cell  $R_5$  usually open. Face without a sharp median ridge up its whole height (if trace of a sharp ridge ventrally then this swelling dorsally). Antennae of varied length but not exceeding the epistomal margin. [*Not parasites of Hemiptera*] . . . . . 7
- 7 Forms with the following characters present simultaneously: eyes bare; antennae short and antennal axis at or below level of eye middle (Text-figs 29-30); gena broad, at least as wide as *length* of third antennal segment and often almost as wide as antennal length (Text-figs 29-30); no definite reclinate orbital setae; rows of frontal setae descending to level of lunula or only just beyond; prosternum bare; *pra* seta small; scutellum with three pairs of marginal setae (basals, subapicals and strong crossed horizontal apicals, Text-fig. 70) (rarely some supernumeraries

also); abdominal T<sub>1</sub> + 2 excavate to its hind margin; infrasquamal hairs absent; ♂ with long slender L-shaped aedeagus (Text-fig. 22). [*Parasites of Coleoptera*]

#### PROSENINAE (part) (p. 41)

[Note: A few non-prosenine forms conform very closely with the characters cited. If specimens conform but from experience do not appear to have a prosenine facies they should be tested next in the tribal keys for Tachininae or Goniinae. If characters appear to conform but the known host is *not* a beetle then pass to couplet 8].

- Forms without such combination of characters present simultaneously, normally failing on at least one and usually more than one of the characters cited. [*Parasites mainly of Lepidoptera, occasionally Hymenoptera, Coleoptera, Orthoptera, Phasmatodea, Mantodea*]. . . . . 8

[Note: If the eyes are densely haired, or the prosternum is *not* bare, or the *pra* seta is very long and strong, then pass immediately to couplet 8 without further consideration: if the eyes are bare, the prosternum bare and the *pra* seta weak then a critical consideration of the other characters cited in the first half of couplet 7 must be made at this point.]

- 8 Pre-alar seta (*pra*) very strong (longer and stronger than first *post ia* seta or the first *post dc* seta) and the prosternum setulose. Propleuron bare. Second costal sector bare ventrally. Infrasquamal hairs absent. [*Parasites of Lepidoptera or Hymenoptera Vespoidea, one genus (Pseudalsomyia) on Cerambycidae*]

#### GONIINAE (part) (p. 74)

- Pre-alar seta (*pra*) small or absent (usually not larger than first *post ia* seta, if larger as in some Tachinini then prosternum bare). Prosternum bare or setulose. Propleuron bare or haired. Second costal sector bare or haired ventrally. Infrasquamal hairs sometimes present. [*Parasites of Lepidoptera, Coleoptera, Hymenoptera Symphyta, Orthoptera, Phasmatodea, Mantodea*] . . . . . 9
- 9 Prosternum bare (haired in a few exceptions but then either hairing on anterior edge of prosternum and on prosternal membrane, or arista plumose, or two strong widely separated *post ia* setae and fore tarsi flattened, or epistomal margin strongly projecting and vibrissae inserted high above level of epistomal margin, or pteropleural seta absent and vein R<sub>4+5</sub> setulose on most of its length). Pteropleural seta present or absent. Epistome often strongly projecting and easily visible in profile, the vibrissae then often high above level of epistomal margin (as in Text-figs 41-46). [*Parasites of Lepidoptera (except Apatemyia on Coleoptera)*]

#### TACHININAE (p. 50)

- Prosternum haired or setulose but sometimes only a single hair on each side (Text-fig. 9) (bare in a *very* few exceptions but then subapical scutellar setae very strongly diverging and either apical scutellar setae absent or male with dense hair fascicles on T<sub>5</sub>). Pteropleural seta present. Epistome not projecting and invisible in profile or at most only rather weakly projecting, vibrissae usually not much above level of epistomal margin (e.g. Text-fig. 49). [*Parasites of Lepidoptera, Coleoptera, Hymenoptera Symphyta, Phasmatodea, Mantodea*]

#### GONIINAE (part) (p. 74)

[Note: It is almost impossible to separate the Tachininae from the Goniinae with small pre-alar seta in a satisfactory way. The distinctions given in couplet 9 should help to separate specimens of the two subfamilies, but in cases of doubt specimens should be run in the tachinine and goniine tribal keys.]

### SUBFAMILY PHASIINAE WITH KEYS TO THE TRIBES AND GENERA

This subfamily is morphologically very diversified but biologically very discrete, for the hosts of the true phasiines are all in the Hemiptera-Heteroptera and all

Tachinidae known to have hemipterous bugs as their hosts belong to the subfamily. In the past the group has often been treated as a separate family (Phasiidae), and certainly many of its members are very atypical looking tachinids – having widened coloured wings and reduced or almost non-existent chaetotaxy; but these less typical tachinids are interconnected with the more typical Tachinidae by many forms with intermediate characters and specialists are now mainly agreed on regarding the phasiines as a subfamily of Tachinidae. Some anomalous forms with coleopterous hosts such as the Strongygastrini and Palpostomatini are sometimes placed among the Phasiinae but it appears better, on the evidence so far available, to limit the subfamily to those forms parasitic on Hemiptera.

The subfamily is moderately well represented in Australia, where all the principal tribes, except the Gymnosomatini, occur. There is an early record of a member of the Gymnosomatini from the Australian area, namely that of Macquart (1847 : 97 (81)) who recorded a specimen of the European species *Gymnosoma rotundatum* (L.) from Tasmania, but it now seems certain that this record must be in error: Malloch (1929a : 112) doubted the occurrence of *Gymnosoma* in Australia as he had never seen the genus from this area, and no specimen has been found since to confirm its existence there. It now appears safe to conclude positively that the Gymnosomatini (certainly the genus *Gymnosoma* Meigen) are absent from Australia.

The main characteristics of the Phasiinae are as follows. Head usually without a facial carina, sometimes with a distinct sublunular bulla between antennal bases, occasionally with weak median ridge, only with a strong sharp keel in Eutherini; rows of frontal setae (often weak and hair-like) descending to level of lunula or first antennal segment (rarely further); ♂ without reclinate orbital setae; head sometimes holoptic in *both sexes* and sometimes with greatly enlarged facets on upper parts of eyes in *both sexes*; eyes always bare; inner vertical setae if present parallel or crossing; arista short pubescent; prosternum and prosternal membrane bare; humeral callus most often with not more than two distinct setae; *post ia* setae almost always 0–2 (except nearly always three in Eutherini); dorsocentral setae very varied, often much reduced; pre-alar seta present or absent, if present nearly always very small (strong sometimes in Cylindromyiini); one or two *sa* setae; postalar callus with not more than two setae; normally from one to three *stpl* setae (four aberrantly) infrasquamal hairs present or absent; usually no definite pteropleural seta; scutellum typically with two or three pairs of marginal setae and without discal setae, sometimes only one pair of marginals (the basals, e.g. in some *Alophora*), rarely four pairs (some Leucostomatini), discs usually present in Eutherini; wing veins bare or at most with only a few minute hairs (long hairs occasionally in Cylindromyiini) on basal node of  $R_{4+5}$ ; mid tibia usually with *v* submedian seta (absent in some Phasiini); hind tibia with or without *pv* apical seta; suprasquamal ridge bare; abdomen with  $T_1 + 2$  excavate only at base, sometimes virtually no excavation (except in Eutherini where excavation reaches hind margin); sternites concealed or exposed; ♂ aedeagus with non-mobile union of basiphallus and distiphallus, distiphallus without longitudinal microstructures ('POS' type) (see Dugdale, 1969).

#### KEY TO AUSTRALIAN TRIBES OF PHASIINAE

- 1 Wing with bend of vein *M* forming a gentle even curve and without trace of an  $M_2$  appendix (Text-figs 74–75). Abdomen dorsoventrally flattened (except in *Saralba* with clavate abdomen) and usually devoid of strong setae. Abdominal sternites partially or completely exposed, ventral ends of tergites not meeting in the mid line. One supra-alar seta. One *post ia* seta or none. Hind tibia without *pv*

apical seta. Scutellum with two pairs of marginal setae (sometimes only the basal pair developed and the hind pair not differentiated). Lower calypter very broad and rather straight or even slightly concave on its hind margin. Infra-squamal hairs present (very minute and placed adjacent to calyptal base, care needed to see them). Last section of vein  $Cu_1$  extremely short, less than half as long as  $m-cu$ . ♀ without proclinate orbital setae . . . . . 2

- Wing with bend of vein  $M$  very abruptly angulate (usually forming a sharp angle of about  $90^\circ$ ) and often with a short  $M_2$  appendix (Text-figs 76-78). Abdomen not dorsoventrally flattened and armed with at least a few very strong setae. Abdominal sternites (except sometimes for  $St_5$ ) concealed by ventral ends of tergites meeting in the mid line. Two supra-alar setae, a strong anterior one and a weak posterior one (sometimes only one  $sa$  in Eutherini). Two or three *post ia* setae. Hind tibia with or without *pv* apical seta. Scutellum with three pairs of marginal setae in most forms (fewer sometimes in *Cylindromyia* and occasional specimens of *Euthera*). Lower calypter slightly or strongly convex on its posterior margin. Infrastomal hairs absent. Last section of  $Cu_1$  at least half as long as  $m-cu$  and usually longer than this. ♀ with proclinate orbital setae (weak or occasionally absent in *Euthera*) . . . . . 3

- 2 Wing with cell  $R_5$  just open or closed at the wing margin, or with a *very* short petiole only just distinguishable (Text-fig. 74). Abdomen conspicuously elongate or clavate, with some very weakly developed marginal setae on the posterior tergites (these recumbent on  $T_4$  and  $T_5$ , usually somewhat erect and stubby on  $T_6$ ). One *post ia* seta present. Second costal sector haired ventrally. ♀ without externally obvious ovipositor. Eyes of both sexes widely separated, interfrontal area very well developed and at least twice as wide as the antenna

#### TRICHOPODINI (p. 32)

- Wing with cell  $R_5$  closed well before the margin and with a long petiole (Text-fig. 75). Abdomen not long and narrow, usually subovate, usually without any strong setae (vestiture almost entirely of hairs). No *post ia* setae or one (if one present this usually very weak). Second costal sector bare ventrally. ♀ with obvious projecting horny ovipositor or with large complex recurved postabdomen. Eyes of both sexes widely separated or meeting in mid line of the frons with consequent reduction of the interfrontal area . . . . . PHASIINI (p. 33)

- 3 Palpi absent. Posteroventral declivity of the thorax forming a deep and completely sclerotized bridge widely separating the base of the abdomen from the hind coxae. Abdomen long and narrow (subcylindrical or slightly clavate) and with postabdomen exposed, large and recurved. Second costal sector haired ventrally. Hind tibia with a strong *pv* apical seta . . . . . CYLINDROMYIINI (p. 36)

- Palpi present. Posteroventral declivity of the thorax membranous medially and forming only a narrow bridge between the abdominal base and the hind coxae. Abdomen not so shaped. Second costal sector bare ventrally. Hind tibia with or without *pv* apical seta . . . . . 4

- 4 Wings colourless. Abdominal  $Tr + 2$  not excavate to its hind margin. Face without a median ridge and antennae very small (falling far short of epistomal margin). Ocellar setae reclinate. Scutellum without discal setae. Two *post ia* setae (widely spaced and anterior one subequal in size to posterior one and standing near to transverse suture) (Text-fig. 56). Apex of ♀ abdomen forcipate (Text-fig. 93). . . . . LEUCOSTOMATINI (p. 38)

- Wings with a bold black-brown pattern (dark colour extending along fore border and in two preapical cross-bands of which proximal one is wider than the distal one, the cross-bands evanescent posteriorly; alula unusually long and narrow and black-brown or mostly so). Face with a broad median vertical keel (sharp on its anterior edge) and antennae exceedingly long (reaching to or beyond level of epistomal margin). Ocellar setae proclinate. Scutellum nearly always with at

least one pair of clearly differentiated preapical discal setae, these semi-recumbent. Usually three *post ia* setae increasing in size from first to third, if only two present then the anterior one remote from the transverse suture. Apex of ♀ abdomen not forcipate . . . . . **EUTHERINI** (p. 39)

### Tribe TRICHOPODINI

The Trichopodini are primarily a tropical and subtropical group and are best represented in the Neotropics, but a few members of the tribe occur in the Ethiopian Region, in the south-east Asian islands, in Melanesia, and in Queensland and New South Wales. In Australia two genera occur, *Saralba* which is an endemic Australasian genus found from New South Wales to New Guinea, and *Pentatomophaga* which is an essentially Afro-Oriental element in the Australian fauna and occurs from Java to Queensland and New Caledonia. The African connection is shown clearly by the fact that *Pentatomophaga* (although here accepted as valid, pending revision of the Old World Trichopodini by a specialist on Phasiinae) is not really distinct from the African trichopodine genus *Bogosia* Rondani (cf., for example, *Pentatomophaga bicincta* de Meijere and *Bogosia minor* Villeneuve).

The chief characteristics of the Trichopodini are as follows. Head dichoptic, interfrontal area wide in both sexes, eye facets not enlarged; ♀ without proclinate orbital setae; face without a median keel; ocellar setae proclinate (often very weak); antennae moderately or very short (not nearly reaching epistome); palpi present; humeral callus with one or two setae; *ph* setae nil or one; *acr* setae usually 0 + 1; *dc* setae variable, commonly 1 + 2, sometimes more; *pra* seta present or absent (usually absent); one *sa* seta; one *post ia* seta; 0 + 1 or 1 + 1 *stpl* setae; infrasquamal hairs present (usually minute); scutellum with two pairs of marginal setae, without discal setae; wings rather long and usually narrow, not normally sexually dimorphic; second costal sector haired ventrally; basal node of  $R_{4+5}$  bare or with one or two very minute hairs; bend of vein *M* forming an open rounded obtuse curve; cell  $R_5$  open or just closed at the wing margin or with a very short petiole (less than the length of *r-m*); wing membrane partially or wholly infuscate; last section of  $Cu_1$  very short (less than half as long as *m-cu*); lower calypter very broad posteriorly and with outer posterior corner rather produced, hind margin straight or slightly concave; legs weakly bristled, tibiae not very strongly curved, hind tibia in many New World forms armed with a long fringe of flattened black scales; hind tibia without a *pd* preapical seta and without *pv* apical seta; hind coxae rather widely separated from abdominal base, but posteroventral declivity of the thorax incompletely sclerotized (membranous or semi-membranous medially); abdomen elongate and dorsoventrally flattened in most forms, sometimes slightly clavate;  $T_1 + 2$  excavate only at extreme base (virtually without any excavation); abdominal bristling very weak, sometimes no definite setae developed (vestiture all hair like); short flattened  $T_6$  visible from above in both sexes (usually armed with some short stubby setae on the posterior part); ♀ postabdomen not recurved, ovipositor very short and inconspicuous.

In both the Australian genera of Trichopodini the thoracic and leg colour is similar: the mesonotum is velvety black or brownish black with two transverse golden or golden-orange bands (one on the posterior half of the prescutum connecting the notopleura and the other on the scutum immediately before the scutellum); and the legs are yellow or orange basally (as far as the basal parts of the femora) and black on the remainder. The head form is shown for *Saralba* in Text-fig. 26.

## KEY TO AUSTRALIAN GENERA OF TRICHOPODINI

- 1 Abdomen uniformly orange or yellow-orange, at most only a little darkened apically. Sides of the abdomen subparallel or very slightly convex (Text-fig. 91). Pre-alar seta absent. One *prst dc* seta. Scutum with the yellow pollinose transverse band extending on to the postalar calli and supra-alar areas **PENTATOMOPHAGA** de Meijere
- Abdomen pallid luteous yellow with a fine dark median line on the basal half and mainly dark brown or blackish on the posterior half. Shape of abdomen distinctly a little clavate, narrower on T1 + 2 and basal half of T3 than on succeeding segments (Text-fig. 90). Small *pra* seta present. At least two *prst dc* setae clearly differentiated. Scutum with the yellow pollinose transverse band more or less confined to the prescutellar area, not extending laterally on to the postalar calli and supra-alar areas . . . . . **SARALBA** Walker

## Tribe PHASIINI

This tribe is nearly cosmopolitan, but in contrast to the Trichopodini (to which it is undoubtedly very closely related) tends to be best represented in the temperate and subtropical parts of the world rather than in the tropics, though many truly tropical species are known. The tribe is represented in New Zealand, where three species of the so-called genus *Campbellia* Miller occur; this genus is treated as valid by Dugdale (1969), but appears to be indistinguishable from *Mormonomyia* Brauer & Bergenstamm, a subgenus of *Alophora* s.l. that is widespread in Africa and Australia.

The Australian fauna of Phasiini is comprised mainly of species (many certainly undescribed) of the genus *Alophora* R.-D. This large genus occurs in both Old and New Worlds and has been split by various authors into many so-called genera that can at best be only very poorly defined (and are found to be largely interconnected by intermediate forms if the world fauna is studied). In addition to being variously split the genus in the wide sense has often been known as *Hyalomyia* (an incorrect spelling of *Hyalomya*), and Malloch in his various papers on the Australian Tachinidae referred all of the described species of the complex to *Hyalomya*. The names *Alophora* and *Hyalomya* were proposed by Robineau-Desvoidy (1830) in the same work, and usage has been rather equally divided in the taxonomic history of the group; recent works on the Eurasian and African Phasiini have, however, mainly adopted the name *Alophora* for the genus, with the name *Hyalomya* applied to one of the constituent subgenera where named subgenera are recognized, and this course is here followed in accordance with the recent work of Draber-Moňko (1965). In her revision of the Palaearctic species Draber-Moňko (*op. cit.*) treats *Alophora* in a broad sense and recognizes seven segregates in the Palaearctic fauna as named subgenera; this approach is by far the most sensible that can be adopted in trying to deal with the difficult *Alophora* complex, and an exactly comparable approach is here adopted for dealing with the Australian fauna (which breaks into a number of moderately distinct entities taxonomically equivalent to those treated as subgenera by Draber-Moňko). At least two of the Palaearctic subgenera, viz. *Alophorella* and *Hyalomya*, can be recognized in the

Australian fauna, and two other subgenera may be represented by species here left subgenerically unplaced (these are *hippobosca* Paramonov whose characters are very close to those of the Palaearctic subgenus *Phoranthia* Rondani, and *nigrisquama* Malloch that has characters similar to those of subgenus *Brumptalophora* Dupuis). Several of the Australian species, however, do not fit any of the Palaearctic segregates, but instead are assignable to *Mormonomyia* Brauer & Bergenstamm, a subgenus of *Alophora* s.l. until now considered to be entirely African. A careful comparison of these Australian species with the African species (including the type-species of *Mormonomyia*) has shown a complete concordance in the essential characters, and it is here considered that the Australian species must be placed as consubgeneric with the African ones; the subgeneric name is therefore applicable to these Australian species. (Here it may usefully be noted that comparison of the New Zealand genus *Campbellia* Miller with *Mormonomyia*, made whilst comparing Australian and African species, has shown no differences that can be considered of any nomenclatorial consequence and the name *Campbellia* ought almost certainly to be placed in synonymy with *Alophora* (*Mormonomyia*).)

In addition to *Alophora* s.l. the Australian Phasiini includes the genera *Efftayloria* and *Besserioides*. The former occurs also in New Guinea and is closely allied to *Alophorophasia* Townsend (synonym: *Kosempomyia* Villeneuve), having the lower surfaces of the femora similarly armed with rows of short stubby spinules. *Besserioides* is entirely Australian on present evidence, but is evidently very closely allied to the monotypic Ethiopian genus *Bogosiella* Villeneuve (from which it differs by having the frons equally wide in both sexes and by having the posterior spiracles of the puparium on prolonged paired bosses).

The main external features of Phasiini are as follows. Head holoptic or dichoptic, some eye facets of both sexes enlarged in some forms; ♀ without proclinate orbital setae; face without a median keel; ocellar setae proclinate or absent; antennae usually short or very short, if moderately long (e.g. *Alophorophasia alata* Townsend) nevertheless falling well short of epistomal margin; palpi present, sometimes weak; humeral callus with 0–2 setae; *acr* setae usually 0 + 1 (hair-like); *dc* setae variable (often hair-like), commonly 1 + 2 (sometimes 3) *post dc* or only one distinct; one *sa* seta; one *post ia* seta or none; usually 1 + 1 or 0 + 1 *stpl* setae, rarely 2 + 1; infrasquamal hairs present or absent; scutellum with one (apical) or two (basal and apical) pairs of marginal setae, rarely weak third pair, without discal setae; scutellum sometimes rather bullate and postscutellum often much produced posteriorly and then visible beyond the scutellum when seen from above; wings either of normal form or (very commonly) much produced in the anal region (especially in ♂) so that they are very broad basally and short; wings often wholly or partially infusate or yellowish or orange basally; second costal sector bare ventrally (first sector often also bare as well); basal node of  $R_{4+5}$  usually with one or two very minute hairs, sometimes bare; bend of *M* forming an even curve without trace of appendix; cell  $R_5$  usually closed well before the wing margin and petiolate, occasionally just open or closed at the margin (closed and petiolate in known Australian forms); last section of  $Cu_1$  very short, less than half as long as *m-cu* (sometimes postero-apical corner of discal cell virtually reaching the margin of the wing); lower calypter very broad posteriorly, hind margin nearly straight but outer posterior corner sometimes strongly produced; legs weakly bristled in most forms or devoid of definite setae, sometimes with a few stubby setae or combs of stubby setulae ventrally on the femora; tibiae often strongly curved or appearing so, hind tibia without scale fringes; hind tibia without *pd* preapical seta or *pv* apical seta; hind coxae close to or at least not very remote from the

abdominal base, posteroventral declivity of the thorax membranous medially or more weakly sclerotized medially than elsewhere; abdomen rounded, subovate or subconical and usually conspicuously flattened dorsoventrally; T1 + 2 excavate only at extreme base (sometimes virtually no excavation); abdominal bristling often weak or absent; ♂ hypopygium recurved under abdomen, ♀ ovipositor usually prominent and piercer-like; sternites fully exposed.

## KEY TO AUSTRALIAN GENERA OF PHASIINI

- 1 Femora armed on half or more of their length with stubby black spinules on *av* and *pv* surfaces. Pteropleuron with a moderately strong isolated pteropleural seta. Vibrissae strong . . . . . **EFFTAYLORIA** Malloch
- Femora without such spinules, vestiture of the ventral surface entirely hair-like. Pteropleuron haired and without a pteropleural seta (at most only one of the uppermost hairs longer and stronger than the others). Vibrissae hair-like or at most only weakly differentiated from peristomal vestiture . . . . . 2
- 2 Eyes of both sexes very strongly approximated or completely meeting in the mid-line of the frons, interfrontal area obliterated medially or if distinguishable distinctly narrower at mid point than third antennal segment. Upper eye facets in both sexes sometimes much enlarged compared to lowermost facets (reaching nearly the size of an ocellus). Antennae small, third segment conspicuously less than twice as long as second segment and falling short of epistomal margin by a distance as great as its own length . . . . . **ALOPHORA** Robineau-Desvoidy
- Eyes widely separated in both sexes, interfrontal area broad and at least nearly twice the width of the third antennal segment. Eye facets of both sexes of almost uniform small size. Antennae moderately large, third segment conspicuously more than twice as long as second segment and falling short of epistomal margin by much less than its own length . . . . . **BESSERIOIDES** Curran

KEY TO AUSTRALIAN SUBGENERA OF *ALOPHORA*

- 1 Lower parafrontals with some fine hairing between the main frontal row of intermixed fine setae and hairs and the eye. Wing with petiole of cell  $R_5$  conspicuously shorter than *m-cu* and less than twice as long as *r-m*. Mesonotum with broad black vittae contrasting with paler greyish or sometimes partly golden pollinose areas (either four separated vittae or the inner pair merged into a generally dark median area). Scutellum with two pairs of marginal setae (basals and apicals) . . . . . 2
- Lower parafrontals completely bare between the main frontal row and the eye (frontal row may consist of an admixture of fine setae and long hairs standing very slightly out of line with each other but essentially forming one main row of vestiture). Wing with petiole of cell  $R_5$  very long, at least as long as *m-cu* and more than twice as long as *r-m* (except in *A. hippobosca*). Mesonotum rather uniformly black and shining, or if partially paler pollinose then not distinctly vittate. Scutellum with either one (basal) pair of setae or with two pairs . . . . . 3
- 2 Epistome distinctly projecting, curving forwards from the facial region and the facial profile therefore distinctly concave . . . subgenus **ALOPHORELLA** Townsend
- Epistome not at all projecting, in the same straight plane as the face when seen in profile (fig. 3 in Malloch, 1929a) . . . **Alophora nigrisquama** (subgenus uncertain)
- 3 Scutellum with two pairs of marginal setae (basals and apicals), and with uniform fine semi-recumbent hairing on the whole upper surface. Postscutellum evenly rounded and not, or only just, visible when fly viewed from directly above (Text-fig. 66). ♂ thorax entirely without flattened lanceolate or scale-like hairs or setae. Scutellum concolorous dark brown or black when seen from any angle,

- slightly or strongly shining. Sublunular bulla flattened and greyish pollinose or shining on upper part adjacent to lunula. Epistome weakly or moderately prominent . . . . . 4
- Scutellum with basal setae and without apical setae (or if a very weak pair of setae present simulating apicals then these situated in a preapical position on disc of the scutellum) (Text-fig. 64); scutellar hairing confined to basal half or two thirds of scutellar disc, usually the hindmost hairing rather erect and stronger than remainder of hairing. Postscutellum very prominent, often narrowed, produced backwards and flattened (sometimes medially slightly sulcate), always partly visible when fly seen directly from above (Text-fig. 64). ♂ with some of the hairing (sometimes also the setae) of the mesopleuron flattened and lanceolate or broadly scale-like, similar flattened vestiture or scales often present also on humeral callus or notopleuron [also on wing-bases and femora in some African species]. Scutellum with posterior part ashy grey or brownish grey (conspicuously contrasting with dark brown or black basal discal part when viewed from behind). Sublunular bulla rounded or knob-like and brilliantly shining. Epistome enormously prominent and the face seen in profile very deeply concave (Text-fig. 28) subgenus **MORMONOMYIA** Brauer & Bergenstamm
- 4 Scutellar dorsum evenly convex. Wing with petiole of cell  $R_5$  at least as long as *m-cu*. Wings of both sexes clear hyaline. Claws of ♂ about equal in length to last tarsal segment . . . . . subgenus **HYALOMYIA** Robineau-Desvoidy
- Scutellum distinctly flattened on posterior half and with a rather sharp thin hind margin. Wing with petiole of cell  $R_5$  conspicuously shorter than *m-cu*. Wings of ♂ dark brown anterobasally. Claws of ♂ enormous, obviously longer than last tarsal segment . . . . . **Alophora hippobosca** (subgenus uncertain)

### Tribe CYLINDROMYIINI

This almost world-wide group comprises some very distinctive tachinids in which, typically, the abdomen is very elongate and subcylindrical and in which palpi are often lacking (as in all the Australian members); in addition to these obvious features the tribe in the strict sense is characterized by having the coxae of the hind legs widely separated from the base of the abdomen by a completely closed and strongly sclerotized posteroventral declivity to the thorax (normally in Tachinidae the median part of this declivity is membranous). The limits of the tribe are not completely clear at present as it is uncertain whether a number of intermediate forms should be considered as contribal with *Cylindromyia* Meigen or not. These intermediate forms include, for example, the Oriental genus *Curtocera* Macquart and *Huttonobesseria* Curran from New Zealand in which the posteroventral thoracic declivity is closed as in *Cylindromyia* but in which there are strongly developed palpi; such forms interconnect *Cylindromyia* and its immediate allies with *Hermya* Robineau-Desvoidy, *Clara* Brauer & Bergenstamm, and like genera in which there is a cylindromyiine body facies but in which the posteroventral thoracic declivity is membranous medially (forming an 'open' bridge) and fully developed palpi occur. It is not germane to consider the limits of the Cylindromyiini on a world basis at present, but the following characteristics are noted as occurring in all the Australian members and most of the extra-Australian members of the Cylindromyiini sensu stricto (i.e. *exclusive* of forms with 'open' posteroventral thoracic declivity and *exclusive* of forms possessing palpi).

Head dichoptic, eyes widely separated in both sexes, eye facets not enlarged; ♀ with two pairs of strong proclinate orbital setae; face without a median keel or very weakly raised medially [a definite sharp keel occurs in the Neotropical genus *Polistiopsis* Townsend]; ocellar setae proclinate; antennae of varied length (much shorter than face in Australian forms, very long and reaching epistome in some forms from elsewhere); palpi absent; humeral callus with 2-4 setae; *acr* setae variable number, likewise *dc* setae; two *sa* setae; two widely separated *post ia* setae (of which the anterior one is enormously strong and stands immediately behind the presutural seta just mesad of the pre-alar seta [a very unusual chaetotactic feature in Tachinidae]) (Text-fig. 58); *pra* seta weak or moderately strong; one, two or three *stpl* setae; infrascapular hairs absent; scutellum with one, two or three (most often three) pairs of strong marginal setae; wings elongate, often partially or wholly coloured; second costal sector haired ventrally; basal node of  $R_{4+5}$  with some minute hairs; bend of *M* forming an abrupt angle, often with  $M_2$  appendix; cell  $R_5$  usually closed and petiolate (Text-fig. 76) [so in all Australian forms], sometimes open to wing margin; last section of  $Cu_1$  usually at least half as long as, sometimes subequal to, *m-cu*; lower calypter evenly rounded on its hind margin; legs moderately strongly bristled, without any scale fringes; hind tibia without *pd* preapical seta (only with *ad* and *d* preapicals) and with a *pv* apical seta; hind coxae widely separated from abdominal base, the posteroventral declivity of the thorax forming a deep completely sclerotized bridge; abdomen very elongate, subcylindrical (Text-fig. 92) or subclavate (in some forms appearing 'waisted' in the manner of Vespoidea), with the postabdomen recurved;  $Tr + 2$  slightly excavate only at extreme base; abdomen with some strong setae; sternites concealed (except for most of  $St_5$ ).

All but one species of Australian *Cylindromyiini* belong to the genus *Cylindromyia*, and the majority exactly resemble some of the common species of *Cylindromyia* found in the temperate latitudes of the northern hemisphere (in fact so close is the resemblance that if the Australian provenance were unknown it would be assumed that specimens were either European or North American); these species have the basal abdominal segments tawny orange or light red (usually with a dark mid line) and the apical segments black. The single Australian *cylindromyiine* species that is not a *Cylindromyia* was described by Bigot under the name *Ocyptera tristis* and is still known only from the holotype; it is undoubtedly congeneric with *Gerocyptera marginalis* (Walker) from Amboina (=Ambon), type-species of *Gerocyptera*, and is therefore here assigned to the genus *Gerocyptera*. (It is worth noting that the type-locality of *tristis* is known only as 'Australia', but as Bigot was sometimes at fault in his recorded provenances there is an element of doubt whether *tristis* is truly Australian, which will only be resolved by future collecting: the genus *Gerocyptera* occurs from the Moluccas to New Hebrides through New Guinea, and if *tristis* is indeed Australian then it probably occurs only in north Queensland.) The head profile of *G. tristis* is shown in Text-fig. 25.

Some species of *Gerocyptera* resemble wasps of the superfamily Vespoidea and the genus is extremely closely allied to the Neotropical genera *Clinogaster* Wulp and *Polistiopsis* Townsend in which the resemblance to vespoid wasps is even more perfect. (All this complex is very rare in collections and nothing is known of the host relations.)

#### KEY TO AUSTRALIAN GENERA OF CYLINDROMYIINI

- 1 Lower calypter with very fine long marginal hairs in addition to the normal very short fringe. Basal node of vein  $R_{4+5}$  on the ventral surface of the wing with a

tuft of very long strong hairs (most of these greatly exceeding the length of  $r-m$ ). Base of costa with exceedingly long hair (obviously much longer than the normal wing fringing) extending from just distad of the basicosta for most of the way to  $Sc$ , but especially strong immediately beyond the basicosta

**GEROCYPTERA** Townsend

- Lower calypter with only the usual *very* short marginal fringe. Basal node of  $R_{4+5}$  ventrally with only a few small hairs or fine setulae, these not exceeding  $r-m$  in length. Base of the costa without such exceptionally produced vestiture

**CYLINDROMYIA** Meigen

### Tribe LEUCOSTOMATINI

The small tribe Leucostomatini occurs mainly in Eurasia and North America, but a few species of *Leucostoma* are found in the Neotropical Region and in the Ethiopian Region (principally in South Africa, but isolated specimens are known from Sierra Leone and southern Arabia). In Australia the existence of the tribe was known for a long time only from a single specimen collected at Sydney (in the ANIC, Canberra collection) and identified by Malloch (1930b) as *Leucostoma simplex* (Fallén) but other specimens of this species (or an extremely closely allied one in the same genus) have recently been obtained in New South Wales, confirming that *Leucostoma* occurs naturally in Australia. (The specimen named by Malloch as *L. simplex* was examined during the present work and directly compared with Fallén's type and other European material: it appears to be correctly identified as this Holarctic species.)

Townsend's (1936, 1938) conception of the tribe included a strangely heterogeneous assemblage of forms, and he even included the Australian genera *Zita* Curran and *Pygidia* Malloch in his Leucostomatini. Whilst admitting that these genera are hard to place reliably, it is hard to conceive of them as having any relationship with *Leucostoma*. As now understood the tribe is a very homogeneous group including forms that are all superficially very similar to *Leucostoma* in which the end of the female abdomen is forcipate, and in which all the members have hemipterous hosts. The genus *Leucostoma* is easily distinguished from the other genera by the long-petiolate wing cell  $R_5$  (a similarly petiolate  $R_5$  occurs in the Mexican genus *Vanderwulpella* Townsend, but the female sex is unknown in this genus and the current assignment of *Vanderwulpella* to the Leucostomatini is probably in error).

A noteworthy feature found in the Leucostomatini is the great development of the lower calyptrae in the males of some forms. In the Oriental genus *Calyptromyia* Villeneuve these are exceptionally large (to which feature the generic name alludes) and dull opaque white, and in males of an undescribed leucostomatine from Madagascar they are so enormous that they completely conceal the abdomen; in this undescribed species the lower calyptrae are (relative to body size) without doubt the largest known in the Diptera, and, being brilliant opaque white contrasting with the shining black head and thorax, give the fly a most spectacular appearance.

The chief characteristics of the Leucostomatini are as follows. Head dichoptic but frons strongly contracted dorsally in ♂, eye facets not enlarged; ♀ with two pairs of proclinate orbital setae (or upper pair divaricate), usually with a pair of outwardly directed prevertical

setae also; face without a median keel (at most only faintly raised on upper part); ocellar setae reclinate or divaricate in most forms (sometimes ocellar setae almost hair-like and then proclinate); antennae falling short of epistome; palpi present; humeral setae varied, usually at least two (rarely one one differentiated); *acr* setae absent or 0 + 1 or 1 + 1; *dc* setae 2 + 3 or 3 + 3; two *sa* setae (hind one sometimes very small); two *post ia* setae (very strong and subequal in size, anterior one nearer to transverse suture than to the posterior one); *pra* seta very small (rarely undifferentiated); from 1-3 *stpl* setae (aberrantly 4); infrasquamal hairs absent (rarely one or two very minute hairs); scutellum with three or four pairs of marginal setae and without discal setae (normally three marginal pairs, but additional weak fourth pair present outside the apicals in *Calyptromyia* and *Clairvillia* Robineau-Desvoidy); wings, normal, clear hyaline; second costal sector bare or haired below; basal node of  $R_{4+5}$  with one hair or strong setula (this feature very constant but a second supernumerary hair may occur in *Calyptromyia*); bend of *M* varied, abrupt or evenly curved, sometimes with  $M_2$  appendix; cell  $R_5$  open, closed at wing margin, or long-petiolate; lower calyptrae rounded, sometimes slightly to enormously enlarged in ♂, often rather opaque white; last section of  $Cu_1$  at least two-thirds as long as *m-cu*; legs with strong setae, always without scale fringes; hind tibia usually with three strong dorsal preapical setae (i.e. *pd* preapical present in addition to *ad* and *d*), but *pd* preapical occasionally very weak or absent; hind tibia without *pv* apical seta (except in *Brullaea* Robineau-Desvoidy); hind coxa and abdominal base approximated, posteroventral declivity of the thorax membranous medially; abdomen elongate-subovate, not flattened above, apex not recurved; T1 + 2 excavate only at base; abdomen with strong setae; sternites concealed; end of ♀ abdomen with a pair of horizontal forceps-like processes (Text-fig. 93).

*Leucostoma*, the only genus known in Australia, can be recognized by the accompanying key to phasiine tribes. The Oriental genus *Calyptromyia* might just possibly occur in northern Australia though not yet found: it is distinguished from *Leucostoma* by having the parafacials completely haired, four pairs of scutellar setae, and cell  $R_5$  open at the wing margin (instead of bare parafacials, three pairs of scutellar setae and long-petiolate  $R_5$ , as found in *Leucostoma*).

### Tribe EUTHERINI

This tribe is currently considered to be composed of the single genus *Euthera* Loew. This very distinctive genus comprises a few species from each major zoogeographical region and an undescribed species from New Caledonia. The tribe is very little known as most of the species are rather rare (or at least poorly represented in museum collections). For many years the hosts remained unknown, but it is now established that *Euthera* parasitizes adult Pentatomidae (Hemiptera), a fact which confirms that the tribe is rightly placed in the Phasiinae. Before the host relations were established the correct position of the genus was rather uncertain and van Emden (1960 : 378, 382) put *Euthera* into the Minthoini because of a resemblance to minthoines in the flattened tarsi.

*Euthera* was split by Townsend, who treated the Eutherini as composed of four genera (Townsend, 1936, 1938) each confined to a different zoogeographical region (*Euthera* proper in North America, *Eutheropsis* Townsend in the Palaearctic, *Preuthera* Townsend in Africa and *Macreuthera* Bezzi in Australia, the last of these originally proposed by Bezzi as a subgenus of *Euthera*). Separate generic

status for these entities is no longer recognized, and certainly cannot be justified in view of the overall homogeneity shown by eutherine species; even Townsend seems to have thought that his penchant for splitting had been carried rather far, as he commented (Townsend, 1938 : 212) that it 'comes near conforming to the proverbial genus for every species'.

In Australia the *Euthera* fauna contains two described species, but it is likely that others exist, as Paramonov (1953) surmises. Paramonov (*op. cit.*) has noted how newly discovered species cut across the character differences that were previously supposed to define subgenera (or genera) within the *Euthera* complex, and has emphasized the need to refrain from any further description of subdivisions within *Euthera*. This is a particularly appropriate plea, as it is obvious from a study of undescribed species in museum collections that there is a more or less complete intergradation of characters between the species of different regions and that it is therefore impossible to maintain any valid subgenera or genera within the complex. Van Emden (1960) took a similar view when he discussed *Euthera* in the Ethiopian Region and formally established the synonymy of *Preuthera* with *Euthera*.

The principal characteristics of *Euthera* and Eutherini are as follows. Head dichoptic, eyes well separated in both sexes but frons a little contracted above in ♂; ♀ usually with proclinate orbital setae, these sometimes weakly differentiated or absent; ♀ with or without a pair of small outwardly directed prevertical setae; face with a large vertical median keel or with a large bulbous swelling, the carination formed into a definite sharp edge medially (Text-fig. 24); ocellar setae usually weak, proclinate or divaricate; antennae extremely long, reaching to epistomal margin or beyond, inserted high on head; palpi present; two main humeral setae, sometimes weak third, or third and fourth; *acr* setae varied, from 2 + 1 to 3 + 4; *dc* setae varied, usually at least 3 + 3, sometimes 4 *prst dc* or 4 or 5 *post dc*; *pra* seta present, small; normally three *post ia* setae, if only two then standing near to each other and remote from transverse suture; two *sa* setae (hind one sometimes very weak or undifferentiated); two *stpl* setae (1 + 1); infrasquamal hairs absent; scutellum usually with three pairs of marginal setae, but apical pair often very weak (crossed, divergent or parallel), apicals sometimes entirely absent, discal scutellars normally present (at least one pair); wings boldly patterned with black-brown colour (this extending along fore border and in two preapical cross-bands which are evanescent posteriorly and of which the proximal one is much broader than the distal one), alula unusually long and mainly black-brown; second costal sector bare below; basal node of  $R_{4+5}$  bare (except in an undescribed Melanesian species in which three or four minute hairs present); bend of *M* very abrupt, usually forming a right-angle or even an acute angle, rarely with short  $M_2$  appendix; cell  $R_5$  long-petiolate; lower calypter rounded posteriorly; last section of  $Cu_1$  from half to two-thirds as long as *m-cu*; legs with strong setae and without scale fringes; hind tibia with two or three dorsal preapical setae, with or without *pv* apical seta; hind coxa and abdominal base approximated, posteroventral declivity of the thorax membranous medially; abdomen elongate-subovate, strongly convex dorsally, apex not recurved;  $T1 + 2$  with excavation reaching to its hind margin; abdomen with strong setae; sternites concealed; no specialized ovipositor.

The most useful spot characters for the genus are provided by the combination of variegated black-brown and hyaline wing pattern, strong median facial keel, exceedingly long narrow antennae, and very long-petiolate wing cell  $R_5$  (Text-figs 24 and 77).

It may be noted that Herting (1966 : 8) implies that the curious European genus *Redtenbacheria* Schiner should be placed in the Eutherini. Such a placement

is insufficiently substantiated at present and the diagnosis of Eutherini given above omits *Redtenbacheria* from consideration.

SUBFAMILY PROSENINAE (DEXIINAE) WITH KEYS TO THE  
TRIBES AND GENERA

The subfamily name Proseninae is here used in order to conform with the recently published catalogues of the Tachinidae of North and South America, although it is now known that it is not the oldest available name that applies to the group; several family-group names based on included genera pre-date the use of Prosenini (-ae) and one of these ought strictly to be used for the subfamily under the priority requirements of the *International Code of Zoological Nomenclature*. It is not yet clear which name should stand valid, and most specialists are in favour of returning to the name Dexiinae (that used to be almost universally applied to the subfamily). The name Dexiinae cannot, however, be validly applied to the subfamily until the type-species of *Dexia* Meigen is changed by a ruling of the International Commission on Zoological Nomenclature; such a ruling has not yet been applied for, although it is under active consideration by interested specialists.

The subfamily is very large and cosmopolitan and its members appear exclusively to parasitize beetles. There are very few host records for the rich Australian fauna, but it is a reasonable guess on present evidence that all will be found to have coleopterous hosts. Several tribes have been delimited within the subfamily by various authors, notably Townsend, but taken as a whole the multiplicity of forms tends to merge together with few if any breaks in the characters that permit satisfactory tribal definitions. Even between the Rutiliini and the rest of the Proseninae (which are conventionally treated as tribally distinct) there are few concrete characters that absolutely serve for reliable tribal discrimination (Crosskey, 1973) of all the forms into one tribe or the other; the genus *Chetogaster* Macquart could, for example, be equally well placed in either the Prosenini or the Rutiliini (in the present work it is retained therefore in its traditional position in the latter tribe).

As with other tachinid subfamilies it is difficult to formulate a fully satisfactory subfamilial definition but the main characteristics of most members of the group are as follows. Head often with a very strong facial carina separating the antennae or with a sharp median ridge (though carina lacking in very many forms); rows of frontal setae descending to the level of the lunula or the first antennal segment; ♂ without reclinate orbital setae; ♂ head often with eyes very strongly approximated but not holoptic (except in a few *Formosia* species); uppermost eye facets normally not enlarged (only enlarged in some *Formosia*); eyes bare [this is true of almost the entire vast complex of world forms included in the Proseninae, but there are a very few exceptions that have haired eyes: examples, *Callotroxis* Aldrich and *Tyreomma* Brauer and Bergenstamm from South America]; inner vertical setae when present often convergent or crossing; prosternum bare (except in a few Rutiliini); prosternal membrane bare (except in some Rutiliini); humeral callus with at least two setae distinguishable (though these may be very weak in Rutiliini); *post ia* setae varied, from none to four; dorsocentral setae varied, often very reduced in Rutiliini, pre-alar seta weak or absent; two or more differentiated *sa* setae in almost all forms; postalar callus with 2-7 setae; usually two or three sternopleural setae (one or none in some Rutiliini); infrascapular hairs nearly always

absent (present at least in some species of *Chetogaster*); scutellum typically with three pairs of strong marginal setae (Text-fig. 70) (including crossed or convergent apicals) but most Rutiliini with more pairs of marginals (4-11) and apicals often reduced; mid tibia with a *v* submedian seta; hind tibia with or without *pv* apical seta; suprasquamal ridge often haired (Rutiliini); abdominal T1 + 2 usually excavate to its hind margin (not in Doleschallini); abdominal sternites concealed by ventral ends of tergites meeting in mid line, at most only slightly exposed and tergite venters slightly parted; ♂ aedeagus long and slender and armed with a backwardly directed spinus (epiphallus) at junctions of the basiphallus and distiphallus (Text-fig. 22).

The curious small tribe Doleschallini, which occurs in the Oriental Region eastwards to New Guinea and the Solomon Islands, has not been found in Australia. It seems just possible, however, that it might be represented in northern Queensland, and the tribe is therefore included in the following key to tribes. The Doleschallini includes the most slender elongate forms found in the Tachinidae and the adults are noteworthy for their habit of resting motionless (and well disguised) on the trunks of trees (especially coconut and, in New Guinea, *Casuarina*) with their exceedingly long spindly legs outstretched.

#### KEY TO AUSTRALIAN TRIBES OF PROSENINAE

[Note: Doleschallini is included although the tribe is not yet known from Australia.]

- 1 Abdominal T1 + 2 excavate to its hind margin. Thorax membranous medially or mainly so between bases of hind coxae and abdominal insertion, coxae and abdomen not unusually remote from each other. Head in profile not strongly subtriangular, as long at the epistome (or nearly as long) as at the level of the antennal axis. Head often with a strong facial carina. Notopleuron distinctly differentiated from the scutum by a groove or shallow depression. Body form usually robust, but if long and slender then abdomen broadest near base or subfusiform. . . . . **DOLESCHALLINI**
- Abdominal T1 + 2 excavate only at the base. Thorax closed above the hind coxae by a broad sclerotized bridge (as in *Cylindromyiini*), the hind coxae widely separated from the abdominal base. Head in profile subtriangular, profrons extraordinarily prominent and lower part of head strongly receding, head *very* much longer at antennal axis than at level of the epistome. Head without facial carina. Notopleuron not differentiated from the scutum by any depression. Body and legs excessively long and slender, the abdomen with subparallel sides (i.e. not distinctly fusiform or widest at base) . . . . . **DOLESCHALLINI**
- 2 Postalar callus with only the normal two postalar setae (at most only a weak setula in addition). Suprasquamal ridge and postalar wall bare. Epistome not produced in front of vibrissal insertions (Text-figs 29-30) or only slightly so (Text-fig. 27), usually not much visible in profile. Propleuron bare or haired. Barete bare or sparsely haired anteriorly (if all haired then no facial carina). Facial carina present or absent. Scutellum with three pairs of marginal setae (some supernumerary marginals differentiated in *Rutilotrixa*). Male hypopygium without long strong erect setae on T7 + 8 (except in *Acucera*). Prosternal membrane and prosternum totally bare . . . . . **PROSENINI** (p. 43)
- Postalar callus with supernumerary strong setae, with a total of 3-6 setae (except in *Chetogaster*). Either suprasquamal ridge or postalar wall usually haired. Epistome subnasute or at least slightly and distinctly projecting in front of the vibrissal insertions in profile (Text-fig. 31). Propleuron haired. Barete thickly

haired along its length (except in *Chetogaster* in which hind part bare). Head always with a strong facial carina. Scutellum with four or more pairs of marginal setae (except in *Chetogaster* with three). Male hypopygium with long strong erect setae on T7 + 8 (usually standing in line on each side of the tergite). Prosternal membrane bare or haired, prosternum bare except in some forms with haired prosternal membrane . . . . . **RUTILIINI** (p. 47)

### Tribe PROSENINI

This tribe contains the great bulk of members of the subfamily Proseninae when the whole world fauna is considered, but in Australia (even allowing that there are doubtless many undescribed forms) forms only a minor proportion of the total prosenine fauna – most of the Australian fauna being comprised by the Rutiliini. The features that differentiate the Prosenini from the Rutiliini are shown in the foregoing key to tribes, and the characteristics of the Prosenini need not be detailed here (further information is, however, given in Crosskey, 1973). The Australian Prosenini fall into two main groups, one containing forms with a heavy broad facial carina that fully separates the antennae and with reduced palpi, and another group (somewhat diverse in its components) containing forms without a facial carina, or with a sharp median facial ridge, and with fully developed palpi.

The first of these groups contains the widespread Old World genus *Prosenia* in which the proboscis is enormously elongate and slender, and a complex of forms closely related to *Prosenia* in which the proboscis is much shorter and stiffer. Several genera have been proposed among the latter forms (*Senostoma*, *Rhynchiodesia*, *Austrodesia*, *Macropodesia*, *Lasiocalypter*, *Lasiocalytrina*) but these merge so imperceptibly into one another – with few character breaks that are maintained when sufficient material is examined of the complex – that it is impossible to recognize most of them as valid genera. The oldest name applying to the complex of forms with short proboscis, strong facial carina, and reduced palpi is *Senostoma* Macquart (a name misused for many years and erroneously applied to various rutiliines) and all the other names, except *Macropodesia*, are here placed as synonyms of *Senostoma*; the broad genus so recognized can be identified by the accompanying key to genera. The genus *Macropodesia* is superficially hardly distinguishable from many of the species of *Senostoma*, but it has the propleuron thickly pale haired and so differs from all *Senostoma* s.l. and from *Prosenia*; probably *Macropodesia* ought also to be placed as a synonym of *Senostoma* and the definition of the genus widened, but it is here preferred to retain *Macropodesia* as valid until the whole complex can be studied in more detail by an Australian worker with more material to hand. It is of interest to note that the propleural hair is white in *Macropodesia* whereas it is black in all other known Australian Prosenini with haired propleuron.

The second group contains a number of endemic Australian genera that differ from the first group (*Prosenia*, *Senostoma* complex) in having fully developed palpi and in the conformation of the facial region of the head (either lacking a facial carina or having a sharp ridge-like keel). The forms in this second group are rather diversified. Most of them form an apparently natural complex in which the

propleuron is black haired and in which there is no facial keel, the genera *Geraldia*, *Acucera*, *Platytainia*, *Hobartia* and *Anatropomyia* coming in this category; the first three of these genera have the parafacials covered with strong black hair. This complex seems to be uniquely Australian and has no counterpart in the fauna of the Oriental Region, but some members closely resemble certain Neotropical forms: *Anatropomyia*, for example, has the same essential characters and very closely resembles '*Theresia*' *erecta* Aldrich from southern Chile (the generic name for this species is placed in inverted commas because the species undoubtedly is wrongly placed in *Theresia* Robineau-Desvoidy but has not yet been reassigned).

Two genera here placed in the Prosenini were recently placed by Paramonov (1968) in the Rutiliini, viz. *Ola* and *Ruya* (= *Rutilotrixa*). These genera (which are so similar to each other that separate generic status is only doubtfully warranted) have a sharp median facial keel (unlike the carina of Rutiliini or of the *Prosenina* group of genera) and an aggregate of characters that better places them in the Prosenini rather than the Rutiliini, though they are to some extent intermediate. The affinities of *Ola* and *Rutilotrixa* are uncertain, but they closely resemble some similarly robust Prosenini from the southern Neotropical Region, especially *Psecacera* Bigot.

The genus *Trichostylum* is disjunct from the rest of the Australian Prosenini. Its overall facies leaves no doubt at a glance that it belongs in the *Billaea* Robineau-Desvoidy complex of genera (or so-called genera) that are a significant component of the prosenine fauna of Africa and Eurasia. The holotype of the type-species has the propleura totally bare (in contrast to the haired propleuron of *Billaea* s.l., *Philotrichostylum* Townsend, etc.) and the genus is on this account retained as valid at present, but apart from the bare propleuron it is scarcely distinguishable from certain species of *Billaea* s.l. that lack a facial carina.

The genus *Heterometopia* Macquart is uniquely Australian and may not truly belong in the Prosenini (where it is here placed as an interim measure) until its characters can be more fully studied and its hosts discovered). It is an aberrant genus in respect of its head structure and especially difficult to place at present. If not a prosenine then it ought probably to be placed in the Tachininae either in the tribe Thelairini or in the tribe Leskiini. A study of the male genitalia would probably help in determining its position.

#### KEY TO AUSTRALIAN GENERA OF PROSENINI

- 1 Head with a large elongate facial carina separating the antennae, the carina convex or flattened on its anterior surface (never forming a sharp ridge) and when seen in profile appearing abruptly marked off from the epistome by a strong concavity (Text-fig. 27). Palpi very reduced, shorter than or at most only as long as the third antennal segment. Two sternopleural setae (except in *Prosenina* with three). Arista plumose. [Mainly slender forms in which males have exceptionally spindly legs with attenuate, often sinuous, tibiae] .
- Head without a facial carina or with a rather sharp roof-like median ridge that does not clearly separate the antennae and when seen in profile is not marked off from the epistome by a definite concavity. Palpi well developed, obviously

- longer than the third antennal segment. Two or three sternopleural setae. Arista micropubescent to short-plumose. [Mainly moderately or very robust forms with legs not markedly attenuate] . . . . . 5
- 2 Three sternopleural setae (2 + 1). Second costal sector haired below. Wing with cell  $R_5$  closed well before the margin and distinctly petiolate (Text-fig. 79). Proboscis very long and slender, length exceeding the height of the head (as in *Prosenia*). Costal spine very strong, at least twice as long as cross-vein  $r-m$  . . . . .
- PROSENA** Malloch
- Two sternopleural setae (1 + 1). Second costal sector bare below. Wing with cell  $R_5$  open at the margin (Text-fig. 80) (except in *Senostoma notatum*), sometimes narrowly. Proboscis long or short. Costal spine not very strong or undeveloped, not longer at most than  $r-m$ . . . . . 3
- 3 Propleuron haired . . . . . **MACROPODEXIA** Townsend
- [Apart from the haired propleuron this genus does not differ from *Senostoma*. The validity of the genus is therefore very doubtful]
- Propleuron bare . . . . . 4
- 4 Proboscis short and straight, rather stiff, length conspicuously less than height of the head and usually not greater than length of the head at the epistome. Usually two *post ia* setae (sometimes three, rarely only one). Abdomen with or without discal setae. Outer part of lower calypter sometimes with long hair on the upper surface . . . . . **SENOSTOMA** Macquart
- Proboscis very long and slender, slightly flexible and sinuous, length conspicuously greater than height of head. Usually one *post ia* seta (occasionally two, but in this case anterior one usually very weak). Abdomen always without discal setae on any tergite. Lower calypter always completely bare on its upper surface . . . . . **PROSENA** Le Peletier & Serville
- 5 Face with a conspicuous roof-like ridge on almost its entire height. Arista bare or virtually so. Four or more *post dc* setae, usually four *prst dc* setae. Scutellum with at least four distinct discal setae (in addition to the marginal setae). Intermediate tergites ( $T_3$  and  $T_4$ ) with median discal setae, those on  $T_3$  sharply distinguished from the very short fine recumbent hairing on either side. Abdominal  $T_5$  with strong subequal setae haphazardly arranged over most of its upper surface. [Large and robust forms with length range 11–19 mm] . . . . . 6
- Face without a conspicuous ridge on its whole height, at most with a trace of a weak ridge or median swelling on the upper part immediately below the antennal bases. Arista pubescent or plumose (pubescence sometimes very short and inconspicuous). Three or four *post dc* setae, nearly always three *prst dc* setae. Scutellum usually without or with two discal setae, occasional specimen with four setae differentiated. Intermediate tergites with or without discal setae. Abdominal  $T_5$  with strong setae usually confined to the apical row, if discal setae present then these few and tending to form a transverse discal row. [Length usually less than 11 mm (holotype of *Trichostylum rufipalpe* measuring just about 11 mm)] . . . . . 7
- 6 Propleuron haired. Scutellar margin with several clearly differentiated marginal setae in addition to the normal three pairs . . . . . **RUTILOTRIXA** Townsend
- Propleuron bare. Scutellar margin usually without marginal setae supernumerary to the normal three pairs . . . . . **OLA** Paramonov
- [The total facies of this genus is so similar to that of *Rutilotrixa* that it is questionable whether separate generic status is justified, despite the bare propleuron. Head profile as in Text-fig. 29]
- 7 Propleuron haired. Second costal sector bare below. Parafacials bare or haired. Two or three sternopleural setae . . . . . 8
- Propleuron bare. Second costal sector haired below. Parafacials bare. Three sternopleural setae . . . . . 13

- 8 Wing with cell  $R_5$  closed well before the margin and conspicuously petiolate (the petiole longer than  $r-m$ ). Parafrontals strongly haired. Three *stpl* setae
- GERALDIA** Malloch
- Wing with cell  $R_5$  open to the wing margin. Parafrontals bare or haired. Two or three *stpl* setae . . . . . 9
- 9 Parafrontals *either* totally bare or fully haired. Arista pubescent or (in *Anatropomyia*) short-plumose. Two or three *stpl* setae. ♀ palpi at most only slightly spatulate . . . . . 10
- Parafrontals strongly haired on the upper half and with two or three minute hairs at the ventral end adjacent to the eye, entirely bare medially. Arista long-plumose. Three *stpl* setae. ♀ with extraordinarily large dorsoventrally spatulate palpi (coloured bright orange and conspicuously contrasting with blackish head and body). [Moderately large form, length about 10 mm, with abdomen slightly shining blue-black or violaceous beneath the thin whitish pollinosity] [Western Australia] . . . . . Undetermined gen.
- [One female specimen from Western Australia seen in BMNH]
- 10 Parafrontals strongly haired . . . . . 11
- Parafrontals bare . . . . . 12
- 11 Three *stpl* setae. 3 + 3 *dc* setae. Third antennal segment distinctly pointed on its outer apex. Bend of vein *M* further from the wing margin than from *m-cu*. Humeral callus with several strong setae differentiated (usually 5–7). Palpi of ♀ distinctly spatulate apically . . . . . **ACUCERA** Malloch
- Two sternopleural setae. 3 + 4 *dc* setae. Third antennal segment evenly rounded apically. Bend of vein *M* nearer to the wing margin than to *m-cu*. Humeral callus with only two strong setae clearly differentiated (only at most one or two weak hair-like setae in addition). Palpi of ♀ evenly slender. Head profile as in Text-fig. 30 . . . . . **PLATYTAINIA** Macquart
- 12 Three sternopleural setae. Arista short-plumose. Epistome distinctly projecting in front of the vibrissal insertions when seen in profile, vibrissae inserted above the level of the epistomal margin. First antennal segment not noticeably projecting. Antennae largely bright orange . . . . . **ANATROPOMYIA** Malloch
- Two sternopleural setae. Arista pubescent. Epistome not projecting when seen in profile, vibrissae inserted about level with the epistomal margin. First antennal segment prominently projecting. Humeral callus with three or four setae standing more or less in line. Antennae not so coloured . **HOBARTIA** Malloch
- 13 Interfrontal area well developed, wider than a parafrontal in both sexes. Frons narrower in ♂ than ♀. Arista with very long plumosity (longest hairs exceeding the width of the third antennal segment). Hind tibia without *pd* preapical seta. Wing vein  $R_1$  bare. ♂ without reclinate orbital setae

**TRICHOSTYLUM** Macquart

[This genus has very much the habitus of *Billaea* Robineau-Desvoidy s.l. but has the propleuron bare. It differs from *Philotrichostylum* Townsend by the same character, but is otherwise exceedingly similar to this genus]

- Interfrontal area very reduced or completely obliterated, in ♀ obviously narrower than a parafrontal and in ♂ eliminated by the fusion of the broad parafrontals in the mid line of the frons. Frons as wide in ♂ as in ♀, much wider than an eye in dorsal view. Arista with long pubescence or short plumosity (longest hairs much shorter than width of antenna). Hind tibia with a *pd* preapical seta (in addition to the normal *ad* and *d* preapicals), though this sometimes very small. Wing with vein  $R_1$  bare or setulose. ♂ without or with one pair of reclinate orbital setae (in latter case these standing very isolated near upper outer corners of the wide frontal region) . . . . . **HETEROMETOPIA** Macquart

[This genus, although running out in the same couplet as *Trichostylum* above, certainly has little or no relationship with *Trichostylum* and may not belong in the Prosenini]

Tribe **RUTILIINI**

This tribe occurs only in the Oriental and Australasian Regions, and forms a dominant element in the tachinid fauna of Australia. A revisionary classification of the tribe has just been published (Crosskey, 1973) and no further discussion is needed here.

## KEY TO AUSTRALIAN GENERA OF RUTILIINI

- 1 Suprasquamal ridge bare. Prosternal membrane bare . . . . . 2
- Suprasquamal ridge haired. Prosternal membrane bare or haired . . . . . 5
- 2 Palpi minute, not longer than basal width of mentum and not longer than third antennal segment. Buccal opening very long and narrow, at narrowest point not wider than facial carina. Arista conspicuously short-plumose. Upper calypter enlarged, when wings folded usually as long as lower calypter  
**PRODIAPHANIA** Townsend
- Palpi well developed, very much longer than either the basal width of mentum or the third antennal segment. Buccal opening wide, much broader than facial carina. Arista pubescent (occasionally with very short plumosity). Upper calypter normal . . . . . 3
- 3 Postalar callus with two strong setae (sometimes with one very much shorter and weaker setula differentiated from hair in addition). Epistome subnasute, facial profile deeply excavate between epistome and carina. Palpi sexually dimorphic, distinctly clubbed or spatulate in ♀ and slender in ♂. Infrsquamal hairs sometimes present. Scutellum normally with only three pairs of marginal setae (at most with four, apicals included) . . . . . **CHETOGASTER** Macquart
- Postalar callus with three or more strong setae. Epistome not very strongly prominent, facial profile usually only slightly concave between epistome and carina. Palpi not sexually dimorphic, long and slender in both sexes (at most only a trace of swelling at extreme tips). Infrsquamal hairs absent. Scutellum normally with 4-11 pairs of marginal setae (including apical pair), very rare specimens with only three pairs . . . . . 4
- 4 Apical scutellar setae inserted at a conspicuously lower level than the other scutellar marginal setae. Postalar wall without dense hair tuft. Ventral margins of abdominal tergites usually with rather weak vestiture, often hair-like, if moderately strong spiniform setae present then these directed backwards as well as downwards  
**RUTILIA** Robineau-Desvoidy (a few forms)
- Apical scutellar setae inserted at the same level as the other scutellar marginal setae. Postalar wall with dense hair tuft. Ventral margins of abdominal tergites with very strong spiniform setae directed downwards  
**FORMOSIA** Guérin-Méneville
- 5 Dorsum of thorax with four broad bold black vittae which are interrupted at the transverse suture, appearing therefore to have eight elongate black spots (four on prescutum and four on scutum). Palpi much shorter than mentum. Postorbital with alternating silvery white and black spots which shift in appearance with direction of the light. Facial carina strongly bulbous on upper part and strongly contracted into sharp median ridge on lower part. Parafacials fully haired, hairing reaching to a level below the lowest point of the eye and virtually continuous with hairing on the genal dilations. [Western Australia]  
**CHRY SOPASTA** Brauer & Bergenstamm
- Dorsum of thorax without such pattern. Palpi as long as or almost as long as mentum. Postorbital without pattern of alternating white and black areas. Facial carina broad and flattened on anterior surface with subparallel sides, or

widened above and contracted ventrally (in latter case not normally formed into a very narrow sharp ridge). Parafacials bare or haired, but if haired the hairing not normally extending below the lowest point of the eye in profile and haired area of parafacials well separated by conspicuous bare area from haired genal dilations . . . . .

- 6 Intermediate abdominal tergites without discal setae. Facial carina usually very broad and flattened, often slightly sulcate, with subparallel sides, at most only a little knob-like dorsally and contracted ventrally. Abdomen without bold black-and-white pattern (rare exceptions). [Forms often with deep median depression in abdominal T<sub>5</sub> or with partly metallic head]

**RUTILIA** Robineau-Desvoidy (most forms)

Intermediate abdominal tergites with discal setae (rarely lacking on one or both tergites but if so then abdomen with black-and-white pattern). Facial carina widest dorsally between junctions of second and third antennal segments and conspicuously narrowed ventrally, not subparallel-sided and not flattened on anterior face. Abdomen most often with bold black-and-white pattern (not in subgenus *Paramphibolia*). [Forms without wide median depression in abdominal T<sub>5</sub> and with the head always non-metallic] . . . . .

**AMPHIBOLIA** Macquart

#### KEY TO AUSTRALIAN SUBGENERA OF *RUTILIA*

[Note. Occasional specimens may have four postalar setae on one side and three on the other: such specimens should be run as if four setae were present on both sides.]

- 1 Parafrontals pollinose, either without metallic colour or only slightly metallic at the vertex. Hind tibia either with well developed close-set anterodorsal fringe or with some well developed *ad* or *pd* setae or with both fringe and *pd* setae. Postalar callus with three or more setae . . . . . 2
- Parafrontals non-pollinose, entirely brilliant metallic green to blue-violet. Hind tibia without anterodorsal fringe and without definite *ad* or *pd* setae. Postalar callus with three setae . . . . . subgenus **NEORUTILIA** Malloch
- 2 Suprasquamal ridge bare and postalar callus with four or five setae. Metallic green, blue to purplish black forms with bold white pollen spots on thorax and abdomen . . . . . subgenus **AMENIAMIMA** Crosskey
- Suprasquamal ridge haired, or if bare then only three strong setae on postalar callus. Colour and pattern varied, but if bold white pollinose spots present then either only three setae on postalar callus or parafacials haired . . . . . 3
- 3 Postalar callus with three strong setae. Hind tibia without a definite anterodorsal fringe (occasional species with weakly developed or irregular fringe). Two or three sternopleural setae (1 + 1 or 2 + 1), anterior *stpl* conspicuous amongst the sternopleural hair. Hair of suprasquamal ridge rather short and sparse, not noticeably crinkled and never extending on to the lower calypter (ridge bare in a few forms) . . . . . 4
- Postalar callus with four or more strong setae. Hind tibia with an anterodorsal fringe. One sternopleural seta (0 + 1), at most only a very weak anterior *stpl* seta distinguishable among the hair. Hair of suprasquamal ridge long, dense and bushy, often crinkled and often extending on to basal depression of lower calypter (ridge always haired) . . . . . 6
- 4 Last abdominal tergite (T<sub>5</sub>) without a median depression, the upper surface evenly convex or at most with only a trace of flattening at the tip. Abdominal T<sub>3</sub> without a transverse row of marginal setae, or if a row present then the setae not markedly spiniform. Scutellum evenly convex on its upper surface. Suprasquamal ridge haired. Arista long-pubescent to short-plumose. Marginal setae

of tergite venters usually weak or hair-like and nearly completely recumbent (not projecting noticeably downwards). ♂ sternite 5 atypical (shaped as in text-figs 32 or 33 in Crosskey, 1973)

5

- Last abdominal tergite with a median depression. Abdominal T<sub>3</sub> with a transverse row of at least a few, usually many, strong erect spiniform marginal setae. Scutellum distinctly flattened or slightly hollowed before the apex. Suprasquamal ridge bare or haired. Arista micropubescent. Setae of inner ventral ends of abdominal tergites rather strong and directed downwards as well as backwards. ♂ sternite 5 with normal simple rounded lobes

subgenus **RUTILIA** Robineau-Desvoidy

- 5 ♂ sternite 5 very strongly acuminate on each side and provided with a pair of submedian downwardly directed protuberances (text-fig. 33 in Crosskey, 1973). Distal membranous part of ♂ aedeagus exceptionally long and whip-like (about twice as long as the sclerotized proximal part of distiphallus, text-fig. 38 in Crosskey, 1973). Only one *post ia* seta (exceptionally a small second seta present in front of main one). ♀ normally without, or with one pair of, proclinate orbital setae. Thorax with distinct white pollinose spots or areas over mesopleuron, sternopleuron, humeral callus and supra-alar areas of scutum

subgenus **GRAPHOLOSTYLUM** Macquart

- ♂ sternite 5 without such acuminate sides and without submedian protuberances (text-fig. 32 in Crosskey, 1973). Distal membranous part of ♂ aedeagus normal in size, shorter than proximal sclerotized part of distiphallus (text-fig. 37 in Crosskey, 1973). Normally two *post ia* setae (one only in occasional specimens). ♀ normally with two pairs of proclinate orbital setae (occasionally one or none). Thorax without distinct white pollinosity and therefore lacking bold white spots

subgenus **MICRORUTILIA** Townsend

- 6 Last abdominal tergite (T<sub>5</sub>) with a median depression and a median transverse row of strong erect setae. Scutellum usually distinctly flattened and without distinct preapical setae in front of the marginal row. Pteropleural hairing not developed in front of the level of the posterior *stpl* seta (text-fig. 20 in Crosskey, 1973). Head with dark ground colour. ♂ genitalia with very large broad foliaceous surstyli without pointed tips (text-figs 67-71 in Crosskey, 1973)

subgenus **DONOVANIUS** Enderlein

- Last abdominal tergite (T<sub>5</sub>) evenly convex across its width, without median depression or at most with only a mere trace of apicomedian hollowing: without a transverse row of strong setae, usually only with long fine erect hairing. Pteropleuron haired on the anteroventral part in front of the level of the posterior *stpl* seta (text-fig. 19 in Crosskey, 1973). Scutellum convex and with an irregular row of small but definite horizontal preapical setae in front of the marginal setae. Head usually with bright yellow ground colour. ♂ genitalia with elongate surstyli which end in a sharp pointed tip (text-figs 72-84 in Crosskey, 1973)

subgenus **CHRYSORUTILIA** Townsend

#### KEY TO SUBGENERA OF *AMPHIBOLIA*

- 1 Thorax and abdomen with bold black-and-white pattern. Apical pair of scutellar setae approximately as strong as the other scutellar marginal setae. Lobes of ♂ sternite 5 simple and rounded on hind margin subgenus **AMPHIBOLIA** Macquart
- Thorax and abdomen without such pattern. Apical pair of scutellar setae much weaker than other scutellar marginal setae (sometimes absent). Lobes of ♂ sternite 5 each with a small blunt tooth or prong on inner edge near the apex subgenus **PARAMPHIBOLIA** Brauer & Bergenstamm

## SUBFAMILY TACHININAE WITH KEYS TO THE TRIBES AND GENERA

This subfamily is to some extent an artificial assemblage of forms that cannot readily be fitted into the other, more discretely defined, subfamilies. Some authors split the group into two or more subfamilies, but as these have not yet been very satisfactorily delimited on a world basis it is considered best for present purposes to recognize the Tachininae in a broad sense. As used here the subfamily equates almost exactly with the concept referred to as the Macquartiinae by van Emden (1960) in his treatment of the Ethiopian Tachinidae (the nomenclature difference arises from the fact that van Emden applied the name *Tachina* Meigen to the genus that should correctly be known as *Exorista* Meigen and used the name *Echinomya* Latreille for the genus that should correctly be called *Tachina*). The usage van Emden adopted has long bedevilled the nomenclature of the Tachinidae and is only now being gradually dropped as the correct usage under the rules of nomenclature becomes gradually established. The subfamily here considered is the one containing the true genus *Tachina* Meigen, type-genus of the Tachinidae, and Tachininae is the correct name applying to it; the names Echinomyiinae, Macquartiinae and Voriinae are synonyms.

The diverse nature and probable polyphyletic origin of the forms included in the Tachininae make it difficult to define the subfamily at all precisely; to some extent it has to be defined by the non-possession of several of the features found in the other subfamilies. There is no single characteristic or any combination of a few features that will absolutely serve to place any particular genus within the Tachininae, but the following list shows the main characteristics that help towards a definition of the subfamily on external adult characters.

Head without a facial carina separating the antennae (at most with a weakly raised median facial ridge or with a convexity on the upper face below the antennal insertions); frontal setae rows descending to the level of the first antennal segment or below; reclinate orbital setae usually present (not in forms with strongly approximated eyes and reduced frons); inner vertical setae often convergent or crossing; uppermost eye facets of ♂ sometimes enlarged; vibrissae nearly always well developed; arista pubescent or plumose; thoracic and abdominal chaetotaxy often fine or reduced; prosternum usually bare; prosternal membrane bare (very rare exceptions); humeral callus with two or more setae normally distinguishable; usually at least three *post dc* setae; two or three *post ia* setae (less in some rare aberrant forms); pre-alar seta almost always weaker than first *post dc* seta, sometimes absent; normally at least two distinguishable *sa* setae (one only in Palpostomatini); postalar callus with two setae (very rarely three or only one); scutellum normally with at least two pairs of marginal setae (one pair only in some Minthoini); sternopleural setae two or three (rarely less, *very rarely* more than three); infrascapular hairs present or absent; fore coxa sometimes haired on its entire anterior surface; mid tibia with a ventral submedian seta (occasionally undeveloped or minute); hind tibia with or without a *pv* apical seta; abdomen with  $T_1 + 2$  excavate or not excavate to its hind margin; sternites of abdomen concealed or exposed; ♂ hypopygium and ♀ postabdomen of varied form.

## KEY TO AUSTRALIAN TRIBES OF TACHININAE

- 1 Ocelli absent. Prosternal region greatly inflated, visible in profile. ♂ head holoptic and with the uppermost eye facets enlarged and conspicuously bigger than lowermost facets. Vibrissae absent . . . . . **ORMIINI** (p. 57)
- Ocelli present. Prosternal region normal, no trace of inflation. ♂ head not

- holoptic (although eyes sometimes very strongly approximated and frons then very reduced), facets not obviously enlarged (except in Palpostomatini) . . . . . 2
- 2 Epistomal region of the head prominent, visible in profile projecting in front of the vibrissae (sometimes head strongly subnasute) (Text-figs 41-46). Vibrissae inserted at a level well above the epistomal margin (only slightly above in some Leskiini). Abdominal sternites at least partially exposed between the ventral ends of the tergites (except in Leskiini) (as in Text-fig. 20) . . . . . 3
- Epistomal region of the head not prominently projecting, invisible in profile (Text-figs 32-38). Vibrissae inserted about on a level with the epistomal margin (undeveloped in some forms). Abdominal sternites concealed by the overlapping ends of the tergites (except in Myiotrixini) . . . . . 7
- 3 Abdominal sternites concealed by overlapping tergite ends (which meet in mid-venter). Scutellum with two pairs of marginal setae (basals and subapicals), without apical setae (except in *Demoticoidea* which has apical setae in addition). Humeral callus usually with two or three setae . . . . . **LESKIINI** (p. 67)
- Abdominal sternites at least partially exposed, ventral ends of the tergites not meeting in the mid-venter. Scutellum with three or more pairs of marginal setae (including a strong crossed apical pair). Humeral callus with four or more setae . . . . . 4
- 4 Hind coxa with long fine hair on the posterodorsal surface. Eyes bare. Parafacials haired. Four *post dc* setae . . . . . **TACHININI** (p. 74)
- Hind coxa bare on the posterodorsal surface. Eyes haired, or if bare (*Amphitropesa* and *Neximyia*) then parafacials also bare. Parafacials bare or haired. Three or four *post dc* setae . . . . . 5
- 5 Hind tibia without a *pv* apical seta. Two *post ia* setae (weak third present in *Australotachina*). Postabdomen of ♂ very large, tergites 6 and 7 + 8 forming an exposed vertical declivity at end of the abdomen. Scutellum with three pairs of marginal setae (except *Australotachina* with four). Bend of vein *M* without an *M*<sub>2</sub> fold or spur-like appendix. Mid tibia without a submedian *v* seta in ♂, with such seta in ♀. Parafacials bare . . . . . **PARERIGONINI** (p. 71)
- Hind tibia with a *pv* apical seta (except in *Amphitropesa*). Three *post ia* setae. Postabdomen of ♂ not of this form, tergites 6 and 7 + 8 not externally visible or only T7 + 8 just visible when hypopygium in situ. Scutellum with four or more pairs of marginal setae. Bend of vein *M* usually with a trace of an *M*<sub>2</sub> appendix or fold. Mid tibia of both sexes with a submedian *v* seta. Parafacials bare or haired . . . . . 6
- 6 Palpi very reduced, often minute or virtually absent (very much less than half as long as the mentum). Parafacials haired (except in *Linnaemya*). Eyes densely haired. Three *post dc* setae . . . . . **LINNAEMYINI** (p. 72)
- Palpi moderately or fully developed (at least half as long as the mentum of the proboscis). Parafacials bare. Eyes bare or haired. Three or four *post dc* setae . . . . . **ERNESTIINI** (p. 70)
- 7 Sternites of the abdomen fully exposed. Vibrissae absent. Head profile as in Text-fig. 40. Lower ends of the facial ridges expanded into a pair of broad flattened and rather evenly haired facialia, and the epistome reduced to a long narrow strip between the facialia connecting the oral margin directly with the face in the same plane. Scutellum with two pairs of marginal setae (basals and subapicals), without apical setae . . . . . **MYIOTRIXINI** (p. 55)
- Abdominal sternites concealed by overlapping ventral ends of the tergites (which meet in the mid-line of the venter). Vibrissae present (but sometimes weakly differentiated from the peristomal setae, especially in Palpostomatini). Head profile not as in Text-fig. 40. Facial ridges and epistome of different form. Scutellum usually with at least three pairs of marginal setae (two pairs only in Palpostomatini and some Minthoini) . . . . . 8

- 8 Scutellum with two pairs of marginal setae (Text-fig. 65). Prosternum with one or two long strong downwardly directed hairs or setae on each side. Head of ♂ almost fully holoptic and with uppermost eye facets appreciably larger than lowermost facets, head profile as Text-fig. 39. Supra-alar area of the scutum with only one strong isolated seta, viz. the first *sa* seta, both pre-alar and second *sa* setae absent (Text-fig. 54). Labellae with a pair of palpiform processes posteriorly (usually distinct). Parafacials haired. Pallid forms with unusually weak abdominal bristling, and very weakly developed postscutellum. [Parasites of scarabaeoid beetles] . . . . . **PALPOSTOMATINI** (p. 53)
- Scutellum with at least three pairs of marginal setae (except in some *Minthoini*). Prosternum bare (except in *Minthoxia* and *Hyleorus*). Head of ♂ sometimes with eyes strongly approximated but not virtually holoptic, uppermost and lowermost facets not noticeably differentiated in size, head with different profile. Supra-alar area of the scutum with at least two setae and usually three (pre-alar seta normally differentiated but sometimes absent in *Minthoini*, second *sa* seta present though sometimes weak). Labellae without palpiform processes. Parafacials bare (except in *Voria* with a strong downcurved seta). Not such forms, postscutellum always strongly convex. [Parasites, where hosts known, of Lepidoptera] . . . . . 9
- 9 Ocellar setae strong and reclinate. Propleuron haired. Facial ridges armed with strong downcurved setae on their whole height. Pteropleural seta absent. Humeral callus with four setae. Eyes haired. . . . . **CAMPYLOCHETINI** (p. 60)
- Ocellar setae proclinate (sometimes absent). Propleuron bare. Facial ridges bare or with weak setulae confined to their lower halves. Pteropleural seta present or absent. Humeral callus with fewer than four setae (except in *Nemoraeini*). Eyes bare or haired . . . . . 10
- 10 Wing with apical part of *M* (i.e. *M*<sub>1</sub>) and cross-vein *m-cu* exceptionally oblique, and with the last section of vein *Cu*<sub>1</sub> exceptionally long (much longer than *m-cu* and nearly as long as the penultimate section) (Text-figs 82-84). Head of ♂ with proclinate orbital and outer vertical setae (like the ♀), and with frons equal in width to that of ♀. Pteropleural seta absent. Presutural intra-alar seta present. Scutellum with long stiff erect preapical setae immediately dorsad of the apical setae . . . . . **VORIINI** (p. 61)
- Wing with *M*<sub>1</sub> and *m-cu* not unusually oblique, and with the last section of vein *Cu*<sub>1</sub> short (at most only very slightly longer than *m-cu*). Head of ♂ nearly always with frons narrower than in ♀ and without proclinate orbital setae (except in *Halydaia*), almost always without differentiated outer vertical setae. Pteropleural seta absent or present. Presutural intra-alar seta absent. Scutellum without erect spiniform preapical setae . . . . . 11
- 11 Vein *R*<sub>1</sub> setulose. Pteropleural seta absent. Scutellum with three pairs of strong marginal setae, the apical pair crossed and horizontal and the subapical pair very widely separated. Second costal sector haired below. Eyes bare or virtually so. 3 + 3 *dc* setae . . . . . **THELAIRINI** (p. 63)
- Vein *R*<sub>1</sub> bare. Pteropleural seta present. Scutellum not so bristled, apical setae if present very weak. Second costal sector haired or bare below. Eyes bare or haired. 2 + 3 or 3 + 3 *dc* setae . . . . . 12
- 12 Inner anterior surface of the fore coxa almost entirely haired. Eyes densely long haired. Abdominal *T*<sub>1</sub> + 2 excavate to its hind margin. Lower calypter haired on the dorsal surface of its outer edge (in addition to its normal fringe-hair). Face with a slight but distinct median ridge, visible in profile (Text-fig. 38). Humeral callus with four or more setae. Palpi noticeably flattened dorso-ventrally. 3 + 3 *dc* setae . . . . . **NEMORAEINI** (p. 66)
- Fore coxa bare on at least most of the inner half of the anterior surface. Eyes bare or haired. Abdominal *T*<sub>1</sub> + 2 not excavate to its hind margin. Lower

- calypter bare on the entire dorsal surface, only with the usual fringe-hair. Face without median ridge. Humeral callus with two or three setae. Palpi not so flattened. 2 + 3 *dc* setae . . . . . 13
- 13 Abdomen with the tergites partially or completely fused on the dorsal surface, sutures of the mid-dorsum largely obliterated. Scutellum rotund and nearly always with distinct preapical (dorsal) setae. Second costal sector haired ventrally. Fore tarsus not flattened. Robust forms with luteous or orange-red colouring and rather broad wings, and with a characteristic row of strong *ad* setae along the fore tibia. . . . . **GLAUROCARINI** (p. 59)
- Abdomen without any fusion of the tergites and all sutures between the tergites complete and distinct. Scutellum slightly or strongly flattened and without preapical (discal) setae. Second costal sector bare ventrally. Fore tarsus, especially in ♀, strongly flattened. More slender or very slender forms with mainly black coloration and long narrow wings, without a row of *ad* setae on the fore tibia . . . . . **MINTHOINI** (p. 64)

### Tribe PALPOSTOMATINI

This curious small group, which appears exclusively to parasitize adult scarabaeoid beetles, is very difficult to place systematically. It includes a small number of forms with rather pallid luteous or light reddish brown colouring that are found in Australia, Africa and the Oriental Region. It is far from clear how the group should be defined, and it is possible that some New World forms such as *Eutrixia* Coquillett and *Eutrixoides* Walton ought to be included within it; they appear to be very similar to the Oriental genus *Eutrixopsis* Townsend, which is normally placed in the Palpostomatini. *Eutrixopsis*, however, has a different conformation to the head than typical palpostomatines, lacks definite vibrissae and has the prosternum bare, and has a third pair of scutellar marginal setae, and it may be a mistake to associate *Eutrixopsis* in the same tribe as *Palpostoma*; but if this present association is correct then the palpostomatines may well have close affinity to the ormiines and to *Myiotrixia* (both of which have resemblances in the head, such as the long epistome and reduced vibrissae, to *Eutrixopsis*). The Palpostomatini have not been studied in detail and in the absence of a reliable placement they are here tentatively assigned to the Tachininae, though on certain features they could equally well be placed in the Proseninae (with which the host relations would certainly fit); *Palpostoma* itself, with its facial conformation and bristled prosternum, even resembles some Blondeliini, and it is not entirely fanciful to imagine some phyletic relationship to this tribe (as to some extent implied by Mesnil's (1966 : 882) placement (under the name Palpostomina)).

The type-genus *Palpostoma* is currently regarded as uniquely Australian, but this is almost certainly only due to the fact that the group badly needs study on a world basis. Comparison of material of the Oriental genus *Hamaxia* Walker (synonym: *Ochromeigenia* Townsend) and the African genus *Hamaxiomima* Verbeke has shown no differences of any significance from Australian material of *Palpostoma*, and undoubtedly *Hamaxia* and *Hamaxiomima* ought to be treated as synonyms of *Palpostoma*; it is inappropriate, however, to pursue this further in the present work and definite synonymy is not established at this time. (The African genus

*Hamaxioides* Mesnil has not been seen but appears from description to be a true palpostomatine distinct from *Palpostoma*: it differs most notably by having the prosternum bare.)

The principal features of the Palpostomatini are as follows. Eyes bare, in ♂ usually very strongly approximated above and with the uppermost facets conspicuously larger than the lowermost facets; ocelli present, often on a very strongly raised ocellar tubercle (Text-fig. 39); inner vertical setae crossed, sometimes virtually absent in ♂; proclinate orbital setae very weak and even sometimes absent in females as well as males; face very deeply excavate and strongly warped forwards at the epistome, but epistome *not* visible in profile; vibrissae weak or sometimes virtually absent, level with or a little above epistomal margin, lower ends of facial ridges often with some characteristic small stubby setulae adjacent to the vibrissae; parafacials sparsely short haired; genal dilation weak or absent; facial ridges bare (excepting the black setulae adjacent to vibrissae); occiput usually rather sunken; frontal setae weak or almost hair-like, rows extending down to about the level of the first antennal segment; arista pubescent; proboscis short, labellae usually with a posterior palpiiform process (whence the name *Palpostoma*); palpi well developed; prosternum usually with one or two very long downwardly directed setae or strong hairs on each side, sometimes bare; prosternal membrane bare; propleuron bare or haired; two strong humeral setae, sometimes minute third seta distinguishable;  $o + 2$  *ia* setae in most forms, sometimes  $o + 1$  *ia*;  $2(3) + 3(4)$  *dc* setae; *acr* setae reduced, usually  $o + 1$  or  $1 + 1$  but variations occur; pre-alar seta absent (or at most minute and hair-like); one *sa* seta only (this very strong and conspicuously isolated in the absence of a *pra* or a second *sa* seta); 2 or 3 *stpl* setae; barette bare; pteropleural seta absent or weak; scutellum usually with only two pairs of marginal setae (basals, and convergent or crossed apicals) and without discal setae (third, lateral, pair of scutellar setae present in *Eutrixopsis*); postscutellum weakly developed, sometimes almost absent; infrascapular hairs present or absent; fore coxa bare on inner anterior part; leg setae rather reduced, mid tibia without or with a very small submedian *v* seta and with one small *ad* seta; hind coxa not very remote from abdominal base, bare posterodorsally; hind tibia with two dorsal preapical setae and without *pv* apical seta; tarsi not flattened; second costal sector haired ventrally; cell  $R_5$  open or short petiolate or closed at the wing margin; bend of vein *M* rounded or moderately sharp and appendiculate; veins bare above except for fine hairs on  $R_{4+5}$  that reach part way to, or fully as far as, *r-m*; last section of  $Cu_1$  as long as *m-cu*; distance on vein *M* from bend to *m-cu* usually as long as or longer than distance from *r-m* to *m-cu*; lower calypter very strongly *diverging* from scutellum, evenly rounded on its hind margin; abdomen with weak bristling and  $T1 + 2$  not excavate to its hind margin;  $T1 + 2$  without median marginal setae; sternites concealed.

The Australian fauna includes two genera in addition to *Palpostoma*, viz. *Apalpostoma* and *Eustacomys*; these are very little known genera, not recorded since the original descriptions of their included species, but are here accepted as valid genera distinct from *Palpostoma*. The Oriental genus *Eutrixopsis* is included in the following key, although as already pointed out there is some doubt as to whether it truly belongs in the Palpostomatini.

#### KEY TO AUSTRALIAN GENERA OF PALPOSTOMATINI

- 1 Prosternum bare. No definite vibrissae or vibrissal angle. One *post ia* seta.  
[Oriental Region including Japan] . . . . . *EUTRIXOPSIS* Townsend
- Prosternum with one or more long seta or hair on each side directed downwards.  
Vibrissae distinctly developed and head with definite vibrissal angle. Two  
*post ia* setae. [Australia] . . . . . 2
- 2 Propleuron bare . . . . . 3

- Propleuron haired . . . . . **EUSTACOMYIA** Malloch
- 3 Wing with cell  $R_5$  open to the wing margin and bend of vein  $M$  sharp and provided with a definite short  $M_2$  appendix . . . . . **APALPOSTOMA** Malloch
- Wing with cell  $R_5$  closed at or before the wing margin (usually short petiolate) and bend of vein  $M$  without trace of appendix . . . . . **PALPOSTOMA** Robineau-Desvoidy

[The extralimital genera *Hamaxia* and *Hamaxiomima* differ from *Palpostoma* only in having cell  $R_5$  narrowly open at the wing margin, like *Apalpostoma*. The closure of cell  $R_5$  probably should not be considered sufficient for generic separation and *Hamaxia* and *Hamaxiomima* would be best placed as synonyms of *Palpostoma* on a redefined basis. Similarly *Apalpostoma* should probably be merged with *Palpostoma* if the presence of a short  $M_2$  appendix at the bend of  $M$  is the only remaining distinction]

### Tribe MYIOTRIXINI

Townsend (1936) erected this tribe for the single genus *Myiotrixia* Brauer & Bergenstamm. This is a very aberrant tachinid that is still known only from the male holotype of *M. prosopina* in the Vienna Museum. The affinities of this species are very obscure and it is therefore appropriate to retain it in its own tribe until its relationships can be determined. The general appearance of the head with its very reduced antennae, lack of vibrissae and broadly dilated flattened setulose facialia is reminiscent of certain ormiines or ormiine-like forms and there may be some relationship between *Myiotrixia* and these forms, or perhaps with the Palpostomatini; any suggestions on the affinities are mere guesswork, however, in the absence of any knowledge of the female, the early stages or the host relations (the overall appearance conveys the impression that *Myiotrixia* might parasitize beetles but there is no evidence for this at present); possibly the Myiotrixini should be placed in Proseninae.

As *Myiotrixia* has been rather poorly described up to now, and not previously figured, the opportunity is here taken to provide a figure (Text-fig. 40) of the curious head and a description of the principal characters shown by the type-specimen (the thorax of the holotype is badly damaged where it is pierced by the large mounting pin but the specimen is otherwise in fair condition and most of the characters can be made out without difficulty: it appears that the specimen was still rather teneral when collected as the lunula and antennal bases are still partially retracted).

Head profile as in Text-fig. 40; eyes rather strongly oblique, with *very* short sparse hairing; vertex about twice as wide as the antennae, slightly sunken around the ocellar triangle; ocelli present, ocellar setae absent; head drawn down anteroventrally so that in profile it forms a rather sharp angle at the epistomal margin; epistome completely invisible in profile, completely flat and equibroad with the face, very sharply differentiated from facialia; facial ridges evanescent above but expanded and flattened below and reaching to anteroventral corners of the head; genal dilation well developed, obliquely reaching to anteroventral corner of the head; gena about one-fifth of eye height; parafacials very narrow, at mid point much narrower than the antennae; interfrontal area well developed, about twice as wide as a parafrontal. Inner vertical setae convergent, outer vertical setae present and strong; frontal setae in about eight pairs, inclinate and crossed, rows not reaching much below level of the lunula; two pairs of long fine erect orbital setae that are scarcely differentiated from the

frontal rows; no proclinate orbital setae; interfrontal area sparsely haired; parafrontals haired; parafacials haired on most of their height (only bare at lower ends) with similar dark hairing to that on the parafrontals; vibrissae absent; facialia with a row of long rather weak setae along the front inner edge (when head seen in profile the row extending from the level of the apex of the antenna to the anteroventral corner of the head) and elsewhere covered with long strong hairing; setulae of postocular row very weak; occiput flat above; postbuccal regions with fine dark hairing, postgenal and mid occipital regions with yellowish hair. Antennae inserted about level with eye middle or slightly above, head about as long at antennal axis as at the epistome when seen in profile; antennae exceptionally small, third segment almost orbicular and only a little longer than second segment; antennae falling short of epistome by a distance very much greater than their own length; arista pubescent, thickened only at its extreme base; proboscis very short, palpi large and flattened and unusually long haired. *Thorax*. Notopleuron rather strongly triangular, with usual two notopleural setae. Prosternum, prosternal membrane and propleuron bare. Propleural seta minute, one strong prostigmatic seta. Anterior spiracle without hair fringe around the opening, sclerotized area of the spiracle large, slightly convex and sparsely long haired. Humeral callus with two strong setae. Pteropleural seta absent, sternopleural setae 1 + 1. Three strong hypopleural setae; pleurotergite bare. [Mediotergite dirty or damaged, condition of infrascutal hairs unknown.] Barete sparsely haired anteriorly. [Chaetotaxy of mesonotum uncertain owing to extensive damage but apparently as follows: 1 + 3 *ia* setae (of which *prst* and first *post ia* hair-like); probably 2 + 3 *dc*; at least 1 + 2 *acr* setae but probably more; small pre-alar seta.] Scutellum with only two pairs of marginal setae (basals and subapicals), no lateral or apical setae or definite discal setae; subapical setae slightly divergent and rather weak, distance between their bases subequal to that between a subapical seta and its corresponding basal seta; hairing of scutellar disc rather weak but long and semi-erect. Postscutellum very strongly developed. *Legs*. Rather short and with very reduced chaetotaxy. Fore coxa bare on inner anterior surface; fore tibia with two minute *pv* setae. Mid tibia *without* a submedian *v* seta, with one very small *ad* seta on apical half and with two or three minute *p* setae. Hind coxae rather close to abdominal base, bare on posterodorsal edge; hind tibia with several very small *ad* and *pd* setae or setulae, with one small *av* seta, without definite *pv* apical seta, and without the normal *d* preapical seta (the dorsal preapical setae represented only by the *ad* preapical). *Wings*. Narrow, very faintly smoky brownish, especially anteriorly. Vein  $R_{4+5}$  with minute setulae extending from node about half-way to *r-m*, wing veins otherwise bare. Second costal sector bare below. Cell  $R_5$  well open at wing margin. Bend of vein *M* evenly and gently rounded, no trace of appendix; distance on *M* from bend to *m-cu* subequal to that between *r-m* and *m-cu*; *m-cu* straight, apical section of  $Cu_1$  very short and only about half as long as *m-cu*. Second costal sector short (length not exceeding that of *m-cu*). Sixth vein stopping well short of wing margin. Calyptrae normal, lower one moderately broad and bare on dorsal surface. *Abdomen*. Short subovate with  $T_1 + 2$  not excavate to its hind margin; each visible tergite subequal in length. Sternites exposed, isolated in wide membranous area of abdominal mid venter. Abdomen completely devoid of bristles, vestiture composed solely of short fine recumbent hairing (the hairing only slightly longer at tergite margins than elsewhere and nowhere erect). All sutures between tergites normal, no trace of fusion. ♂ hypopygium small, no noteworthy external characters [not examined at this time as holotype unique: later examination of male genitalia may well shed light on the affinities]. *Coloration*. Almost entirely blackish brown; antennae, lower end of interfrontal area and area of head between genal dilation and facialia paler reddish brown; abdomen covered with pale yellowish pollinosity that is thickest on basal parts of the tergites, the tergites therefore appearing darkest towards hind margins and also medially but appearance slightly shifting with light direction. Body hair black or brownish black except for some yellowish hair posteriorly on the head. *Measurements*. Body length about 6.0 mm, wing length 5.3 mm.

The holotype bears three handwritten ink labels that read '56', 'Thorey 1864

Austra. sept' and 'N.G. [=new genus] ad Oestrophasia N. Holl.', and Brauer & Bergenstamm's determination label that reads 'prosopina det. B. B.' (specific name handwritten, remainder printed).

### Tribe ORMIINI

This small tribe occurs mainly in the tropical and subtropical parts of the world, and contains some of the most aberrant forms to be found in the Tachinidae. Several genera have the chaetotaxy very reduced and have a robust form and curious head facies reminiscent of the Oestroidea. Biologically the group is particularly interesting because the first-stage larva is the most perfectly formed planidium occurring in the Diptera (though *Glaurocara* has a similar planidium: see under Glaurocarini) and the hosts appear always to be nocturnally active Orthoptera (crickets and Tettigoniidae s.l.). Many forms have the pallid coloration often associated with nocturnally active flies.

At present the Ormiini are uniquely characterized by having the prosternal region of the thorax greatly inflated (usually more so in females than males) and visible when the fly is seen in profile. The function of this oddly modified prosternum is unknown; such a feature occurs in no other Tachinidae. Another very unusual character among Tachinidae that occurs in many Ormiini is the reduction of the ocelli, some genera having the ocelli vestigial or totally wanting; all the ormiines so far known in the Australasian fauna and in the African fauna are without ocelli. In the Oriental fauna the genera *Homotrixa* Villeneuve and *Xanthooestrus* Villeneuve possess ocelli, but in these genera the prosternal membrane is only moderately inflated (*Homotrixa*) or not noticeably inflated at all (*Xanthooestrus*) and it is not certain that the genera truly belong in the Ormiini.

The existence of forms such as *Xanthooestrus*, which has an entirely ormiine facies but has a normal prosternum, and of forms such as *Glaurocara*, which has a different morphological appearance yet has a perfect planidium larva and host relations like the Ormiini, poses the question of whether the Ormiini ought to be redefined on a much wider basis than at present. It appears now that a definition of the Ormiini to include only those forms with inflated prosternal membrane is too restrictive, and that several forms placed outside the group at present should be brought into it. At present, however, insufficient is known of these generally rather rare forms to permit any worthwhile re-evaluation of the Ormiini on a world basis, and the Ormiini is here accepted in its usual confined sense with the Glaurocarini recognized as a separate (rather intangibly defined) tribe.

The main characteristics of the Ormiini are as follows. Eyes very large, bare, facets conspicuously enlarged in most males; head of ♂ usually holoptic or almost so, ♂ frons therefore virtually absent; ocelli present or absent, when present often strongly raised in ♂; inner vertical setae absent in male, usually present and converging or crossed in ♀; proclinate orbital setae absent in ♂, weak in ♀; parafacials bare; epistome not projecting, invisible in profile, often formed into a receding strip which curves for a long distance between a reduced face and the oral cavity; oral cavity, proboscis and palpi often exceptionally reduced; vibrissae present or absent, when absent lower ends of facialia usually formed into broad haired areas on each side of the epistomal strip; genal dilation weak or virtually absent; occipital region

flat; frontal setae reduced or hair-like, rows reaching about to level of first antennal segment; antennae small or minute, third segment rounded apically and usually not longer than second segment, ends of antennae falling short of margin of oral cavity by a distance at least equal to length of third antennal segment and usually by a distance much greater than their own length; arista bare to short plumose; prosternal region inflated, prosternum and membrane bare; propleuron bare; propleural and prostigmatic setae often hair-like; humeral callus with two strong setae in most forms; mesonotal chaetotaxy varied, often much reduced (Text-fig. 55), normally  $2 + 3$  *dc* setae and  $0 + 1$  or  $0 + 2$  *ia* setae (rarely a minute third *post ia* or no *ia* setae at all); *pra* seta small or very small, either one or two *sa* setae; usually two *stpl* setae, sometimes only one; pteropleural seta absent or present (if present usually weak); infrascapular hairs absent; scutellum usually with three pairs of marginal setae, the apicals usually crossed; fore coxa usually bare on much of inner anterior surface; mid tibia without submedian *v* seta or with a small *v* seta; hind coxae bare posterodorsally, not remote from abdomen; hind tibia with small *pv* apical seta and two dorsal preapicals; wing with second costal sector usually rather long and haired ventrally; costal margin sometimes (in New World forms only) with callus-like dilation between apices of  $R_1$  and  $R_{2+3}$  in ♂; cell  $R_5$  open or closed; bend of vein *M* very sharp, usually about a right-angle, usually with short  $M_2$  stump-like appendix; distance from bend of *M* to *m-cu* shorter than or subequal to *m-cu/r-m*; upper surface of wing veins totally bare or with a few minute hairs only on basal node of  $R_{4+5}$ ; lower calypter broad, inner posterior angle close to scutellum; abdomen rotund, usually with much reduced chaetotaxy, often without any definite bristles;  $T_1 + 2$  excavate to hind margin; sutures of abdomen distinct; intermediate abdominal tergites always without discal setae; sternites widely exposed; ♀ terminalia modified for deposition of planidia.

In Australia the Ormiini were unknown until Paramonov (1955) described two species from Queensland and assigned them to the supposedly new genus *Ormiominda* Paramonov. In an earlier paper (Crosskey, 1966b) it was shown that *Ormiominda* cannot be distinguished from the widespread Old World ormiine genus *Therobia*, and the opinion given earlier that *Ormiominda* is a synonym of *Therobia* is here upheld as undoubtedly correct. *Therobia* is the only genus of the tribe yet known in Australia, but it is possible that *Phasioormia* Townsend occurs in north Queensland; the latter genus occurs from Burma to Papua and may ultimately be found in Australia (hence its inclusion in the key that follows). Finally it may be noted here that Paramonov's species of *Therobia* from Queensland seem rather doubtfully distinct, and it is also uncertain whether either or both are really separate species from *T. braueri* (Kertész) from New Guinea, *T. vesiculifera* Bezzi from Fiji, or *T. insularis* Séguy from New Caledonia (some or all of which may well be synonymous with each other).

#### KEY TO AUSTRALIAN GENERA OF ORMIINI

- 1 Epistome forming a long narrow strip running from the oral cavity to the antennal apices and flanked on each side by broad flattened and rather evenly haired facialia. No vibrissae. Antennae minute, length much less than a quarter of eye-height, apices separated from the oral cavity by a distance very much greater than their own length. Oral cavity extremely reduced and subcircular. Frons of ♀ usually noticeably tapering towards the ventral end . . . **THEROBIA** Brauer
- Epistome normal, without such form. Vibrissae distinct. Antennae not exceptionally small, length greater than a quarter of eye-height, apices separated from oral cavity by a distance less than their own length. Oral cavity not exceptionally reduced, normally obviously longer than its width. Frons of ♀ with parallel sides  
**PHASIOORMIA** Townsend

## Tribe GLAUROCARINI

This is a very small tribe that is confined to the Old World tropics and subtropics and contains only the two genera *Glaurocara* Thomson and *Doddiana* Curran; other supposed Old World genera have been described (*Oestrocharis* Villeneuve, *Semisuturia* Malloch and *Oestrocara* Townsend) but these are now treated as synonyms (Crosskey, 1962). Townsend (1936) placed several New World genera in the tribe but none of these have the fused abdominal tergites of true Glaurocarini and evidently do not belong. *Doddiana* occurs from Java to Queensland and New South Wales, and *Glaurocara* occurs in Malaya, the south-east Asian archipelago, the Ethiopian Region and Mauritius; Mauritius is the type-locality of *G. flava* (type-species of *Glaurocara*) and is also a locality into which *Doddiana mellea* (Wiedemann) has been unsuccessfully introduced from Java for control of sugar-cane moth borer.

The only host recorded for the genus *Doddiana* is the sugar-cane moth borer *Chilo sacchariphagus* (Bojer) (Lepidoptera: Pyralidae), which is apparently attacked by *Doddiana mellea* in Java. This is a curious record, as *Doddiana* is without doubt very closely allied to *Glaurocara* and the type-species of this genus, viz. *G. flava* Thomson from Africa, is a parasite of nocturnally active tettigoniid Orthoptera (Crosskey, 1965b). It is odd that species of two such similar genera as *Doddiana* and *Glaurocara* should attack hosts as different as a pyralid and a bush-cricket. It seems probable, however, that Orthoptera are the normal hosts of the Glaurocarini, as *Glaurocara* first-stage larva is a perfect planidium closely similar to that of the Ormiini and the ormiines (so far as is known) are exclusively parasites of Grylloidea and Tettigoniioidea. *Glaurocara* also resembles the Ormiini in being nocturnally active and in having the pallid luteous yellow coloration characteristic of night-flying Diptera, and its female reproductive system is of Townsend's type XXXII which is elsewhere found only in the Ormiini. On these grounds it appears that the Glaurocarini are closely allied to the Ormiini, although they differ obviously from the latter tribe by having the sutures between the abdominal segments largely fused above and in having a normal prosternum (without trace of the inflation of the prosternal region as occurs in Ormiini).

The chief characteristics of the tribe are as follows. Head unusually small for body size; eyes usually with some very minute sparse hairing (appearing bare at first glance); ♂ head with eyes strongly approximated and frons reduced but not holoptic; ocelli present, usually rather raised; inner vertical setae present in both sexes, usually convergent or crossed; ♂ without proclinate orbital setae, ♀ with two pairs (very strong); ♀ with one pair of reclinate orbital setae; parafacials bare; frontal setae moderately strong, rows reaching to a level with first antennal segment; epistome flat, invisible in profile, face rather flat; oral cavity, proboscis and palpi very small; vibrissae present, inserted about level with or just above epistomal margin; facial ridges with a few setulae above vibrissae, otherwise bare; genal dilation weak, only reaching at most half way forwards on the genal region, usually bearing some rather strong setae or setulae (Text-fig. 34); occiput moderately flat above; antennae small (length about half the eye height), inserted about on a level with eye middle; arista with short or long pubescence; prosternum not inflated, bare, prosternal membrane bare; propleuron bare; prostigmatic and propleural setae very strong; humeral callus with two strong setae (sometimes a weak third seta present mesad of main two); mesonotal chaetotaxy usually as in Text-fig. 57; 0 + 2 or 0 + 3 *ia* setae; 2 + 3 *dc* setae; *acr* setae variable; *pra* seta weak or absent, second

*sa* seta present but very weak; pteropleural seta present; 2 *stpl* setae; infrasquamal hairs absent; scutellar setae very variable, but always at least three pairs of marginals, subapical pair subparallel or weakly divergent and inserted close together, discal scutellar setae almost always present, scutellum unusually rotund; fore coxa bare on inner anterior half, fore tibia with a row of strong *ad* setae or setulae along its length (usually also with some small *p* setae in addition to the normal *pv* setae), mid tibia with a submedian *v* seta; hind coxae not remote from abdominal base, bare posterodorsally; hind tibia without *pv* apical seta, with two dorsal preapical setae; wings relatively large compared to body size; second costal sector haired below; cell  $R_5$  narrowly open at wing margin; bend of vein *M* abrupt, with or without  $M_2$  appendix; distance from bend of *M* to *m-cu* less than that between *r-m* and *m-cu*; last section of  $Cu_1$  shorter than *m-cu* (Text-fig. 81); wing veins bare above except for some minute setulae on basal node of  $R_{4+5}$ ; lower calypter moderately broad, inner posterior angle near to scutellum; abdomen rotund, dorsally with the sutures between the tergites mainly obliterated by tergite fusion;  $Tr + 2$  excavate only basally; sternites concealed.

#### KEY TO GENERA OF GLAUROCARINI

- 1 Bend of vein *M* very abrupt and with a distinct  $M_2$  appendix. Tip of the scutellum with a pair of small fine straight apical setae between the strong close-set subapical setae (if rarely there are no distinct apicals then tip of scutellum with at least some hairs between the subapical setae) . . . . . *GLAUROCARA* Thomson
- Bend of vein *M* moderately abrupt but without trace of  $M_2$  appendix. Tip of scutellum without apical setae and usually totally bare between the bases of the strong close-set subapical setae . . . . . *DODDIANA* Curran

#### Tribe CAMPYLOCHETINI

Townsend (1936) erected this tribe for a small number of genera found in each of the major zoogeographical regions and apparently closely allied to the Voriini. The group is easily recognized by having the strong ocellar setae directed backwards (a very unusual character found elsewhere in Australian Tachinidae only in the Goniini and in *Leucostoma*) and simultaneously having the propleuron haired and the facial ridges strongly bristled. Until now the tribe has not been reported from Australia, but recent collecting has shown the presence of some undetermined (probably new) species in Australia and Tasmania that clearly belong in the genus *Elpe* Robineau-Desvoidy; this is the only genus so far discovered in Australasia. The genus *Elpe* is widespread in the Palaearctic, Ethiopian and Oriental Regions but apparently does not occur in the New World. Mesnil in various publications has referred several species of the genus to *Frivaldskia* Schiner (= *Fallenia* Meigen, preoccupied), but the true *Frivaldskia* (type-species *F. longicornis* (Fallén)) has the parafacials partially haired and cell  $R_5$  closed and appears to be generically distinct from *Elpe* (van Emden, 1960 : 351). (Here it may be noted in passing that *Frivaldskia* is the correct original spelling and that the various alternatives such as *Frivaldszskia* and *Frivaldzkia* that have currency in the literature are incorrect subsequent spellings.)

Van Emden (1960) placed *Elpe* as a subgenus of *Campylocheta* Rondani, but the latter has a different facies from *Elpe* and has three (instead of two) *stpl* setae and extensively hairy parafacials (instead of bare parafacials as in *Elpe*). It

appears best to treat *Elpe* and *Campylocheta* as separate genera, but *Frivaldskia* ought probably to be treated as a synonym of *Campylocheta*.

The principal characters of the tribe are as follows. Eyes haired; facial ridges strongly setose (Text-fig. 33); face deeply sunken but epistome not projecting; vibrissae level with epistomal margin; antennal axis well above level of eye middle; head receding below, much shorter at vibrissal axis than at antennal axis; ocellar setae very strong and directed outwards and backwards; inner vertical setae parallel; parafacials bare, or haired on upper half only; proboscis very short, palpi well developed; prosternum and prosternal membrane bare; propleuron pale haired; humeral setae four (basal row of three and one set forwards); 2-3 + 3 *dc* setae; pre-alar seta very small; 1 + 3 *ia* setae; two or three *stpl* setae; scutellum with three pairs of very strong marginal setae (basals, subapicals and horizontal crossed apicals), subapicals extremely wide apart, occasionally a weak fourth pair of setae present *between* the subapicals and apicals; scutellum without definite discal setae; pteropleural seta absent; infrascapular hairs present or absent; fore coxa bare on inner anterior surface; mid tibia with a *v* seta; hind tibia without *pv* apical seta, usually with three strong *d* preapicals; hind coxa bare posterodorsally; wing with several strong setulae dorsally on node, veins usually otherwise bare above (some American forms with  $R_1$  setulose);  $R_5$  open or closed in wing margin (occasionally very short-petiolate); bend of vein *M* forming very obtuse angle, without appendix, remote from wing margin; distance on vein *M* from bend to *m-cu* at least equal to and usually greater than that from *r-m* to *m-cu*; apical section of  $Cu_1$  longer than *m-cu*; second costal sector very short and haired ventrally; calyptrae normal; abdomen with  $T_1 + 2$  excavate to, or almost to, its hind margin;  $T_1 + 2$  without median marginal setae; intermediate abdominal tergites with discal setae;  $T_5$  with a complete transverse row of very strong erect discal setae around the upper surface; sternites concealed; male hypopygium very conspicuous,  $T_7 + 8$  at least partially exposed, cerci enormous and curved forwards (slightly hook-like) in profile.

Finally here it should be noted that the spellings *Campylochaeta* and *Campylochaetini* in the literature are erroneous, as *Campylocheta* Rondani is the correct original spelling in nomenclature.

### Tribe VORIINI

Most of the members of this tribe have a very characteristic head facies and wing venation and it is usually possible to recognize the vorini easily once one of the genera has been seen in a named collection; often one glance at the wing is sufficient for reliable tribal placement. The notable features of the head and wing alluded to are listed in detail later. The tribe is nearly cosmopolitan, and includes four genera in New Zealand; in this tribe there is therefore, perhaps, some faunal connection between Australia and New Zealand. Three genera are known from Australia, all of which occur also outside the area: *Voria* occurs widely in the New World and throughout most of the Old World, *Afrovorina* occurs in Africa, India and Western Australia, and *Hyleorus* occurs in New Guinea as well as Australia. When the Voriini are studied in more detail it will almost certainly be concluded that *Hyleorus* is widespread also in the Ethiopian Region and Eurasia (including Japan) as there appears to be little doubt that the genus *Steiniomyia* Townsend (synonyms *Neuroplagia* Townsend and *Afroplagia* Curran) is identical with *Hyleorus*; comparison of material of several species of *Steiniomyia* (including *elata* Meigen, the type-species) with *Hyleorus* from New Guinea and Australia has shown no

differences that could fairly be interpreted as of generic significance, but it is outside the scope of this work, to consider this further at present (as *Hyleorus* has priority and will stand as the valid name in any case) and definite synonymy is not established at present.

The main characteristics of the Voriini are as follows. Head not noticeably sexually dimorphic, both sexes with outer vertical setae and proclinate orbital setae; eyes bare or haired; ocellar setae divaricate-proclinate or absent; inner vertical setae subparallel; facial ridges bare, or weakly setose for half their height; parafacials usually with hairs or strong downcurved setae on part of their height, sometimes bare; face rather flat, epistome not projecting (invisible in profile); vibrissae level with epistomal margin; upper occiput without black setulae; antennal axis about level with or slightly above eye middle; proboscis short, palpi well developed; antennae often with second segment unusually long in relation to third, arista thickened on at least half its length, often with second basal segment very elongate; prosternum bare or haired, prosternal membrane bare, propleuron bare (haired in a few rare exceptions); humeral callus with two strong setae and usually a third smaller seta mesad of main two and one small seta set forwards; mesonotal chaetotaxy typically as Text-fig. 59;  $1 + 3$  *ia* setae;  $2$  or  $3 + 3$  *dc* setae (very rarely four *post dc*); pre-alar seta very small; three sternopleural setae (very rarely only two); pteropleural seta either absent or enormously strong; infrasquamal hairs present or absent; scutellum with three pairs of strong marginal setae (basals, widely spaced subapicals and crossed horizontal apicals), and nearly always with a pair of long strong stiff erect preapical setae immediately above the apicals (sometimes some additional long stiff erect setae further forwards on the disc of the scutellum in addition); fore coxae usually haired on most of its inner anterior surface; fore tibia typically with a series of definite *ad* setae or setulae along its length; mid tibia with a *v* seta; hind coxa bare posterodorsally; hind tibia with or without small *pv* apical seta and with two *d* preapicals; wing extensively setulose dorsally on the veins ( $R_{4+5}$  setulose on much of its length,  $R_1$  and  $Cu_1$  also often setulose); bend of vein *M* strongly angulate and remote from wing margin, *M* continued towards the wing margin by a long or often very long  $M_2$  spur vein or by a darkened fold (Text-figs 82–84); last section of vein  $Cu_1$  much longer than *m-cu* and nearly as long as or even longer than penultimate section;  $M_1$  and *m-cu* usually exceptionally oblique (some New Zealand forms with *m-cu* non-oblique); cell  $R_5$  usually open at wing margin, sometimes closed in margin or long-petiolate; second costal sector short or very short, bare or haired ventrally; abdominal  $T_1 + 2$  excavate to its hind margin or almost so; sternites concealed; ♂ hypopygium with exceedingly long slender curled aedeagus.

#### KEY TO AUSTRALIAN GENERA OF VORIINI

- 1 Parafacial bare, without either hairs or strong downcurved setae. Arista thickened on more than half its length, second aristal segment at least twice and usually more than twice as long as its greatest breadth . . . . . 2
  - Parafacial with a very strong downcurved seta inserted at the upper end immediately below the lowermost frontal seta (Text-fig. 37). Arista thickened only on its basal half, second aristal segment not longer than wide or only inconspicuously so
- VORIA** Robineau-Desvoidy
- 2 Prosternum haired (sometimes only a single hair on each side). Eyes obviously hairy.  $M_2$  spur vein exceedingly long, usually much longer than the section of vein *M* between *m-cu* and the bend (Text-fig. 84) [slightly shorter in an undescribed species from Philippines]. Both intermediate abdominal tergites with erect discal setae. Facial ridges setulose on half their height (in profile no gap between the uppermost setula on the facial ridge and the lowermost frontal seta)

**HYLEORUS** Aldrich

[The Eurasian and African genus *Steiniomyia* Townsend runs here and has all the essential characters of *Hyleorus*. It should be treated as a synonym of the latter, but definite synonymy is not established at this time]

- Prosternum bare. Eyes bare or almost completely so.  $M_2$  spur vein or fold short, not nearly as long as the section of  $M$  between  $m-cu$  and the bend (Text-fig. 82). One or both intermediate abdominal tergites without discal setae. Facial ridges bare (except for the usual very few setulae immediately above the vibrissae)

#### **HYSTRICOVORIA** Townsend

[The Ethiopian and Oriental genus *Afrovorio* Curran (synonym *Anavorio* Mesnil) runs here and has all the essential characters of *Hystricovoria*. It should probably be treated as a synonym of the latter, but definite synonymy is not established at this time]

### Tribe THELAIRINI

This is a small but widely distributed tribe occurring in both Old and New Worlds. The type-genus *Thelaira* is found throughout the Palaearctic and Oriental Regions, Africa and Madagascar, in New Guinea and in eastern Australia south to Tasmania, and in the New World occurs southwards as far as Mexico; in the Pacific area the genus is apparently unrepresented eastwards of New Guinea. The only genus found so far in Australia, other than *Thelaira*, is *Halydaia*, a very distinctive form occurring in most of the Oriental Region eastwards to Japan, the Ryukyu Islands, New Guinea, the Solomons and Australia (excluding Tasmania); at least one rare species of *Halydaia* occurs also in western Europe. In the Old World *Halydaia* appears to be rather disjunct from other thelairines, but the genus appears to be rather closely related to the Neotropical genus *Xanthodexia* Wulp (syn. *Minthodexia* Brauer & Bergenstamm) which is somewhat intermediate between *Halydaia* and the more typical Thelairini.

The chief characteristics of the Thelairini are as follows. Eyes bare or virtually so (some very minute hairs can sometimes be made out under high power examination); parafacials bare; eyes extremely large and filling most of the sides of the head, gena correspondingly very reduced and without a definite genal dilation (eyes coming so far down on the head that the lowest point is usually *below* the level of the vibrissae); face and epistome flat, latter invisible in profile; vibrissae usually level with epistomal margin (above the level in the Oriental genus *Prosheliomyia* Brauer & Bergenstamm); antennae small or very small (length less than half of eye-height) and antennal axis at or below level of eye middle; arista usually short plumose or long plumose, sometimes pubescent; proboscis *very* short, mentum convex on lower edge in profile, palpi well developed (a little flattened); prosternum, prosternal membrane, and propleuron bare; two sternopleural setae (rarely three in ♂); 3 + 3 *dc* setae; pre-alar seta very small; two or three *post ia* setae (rarely specimens may have only one); infrasquamal hairs usually absent; scutellum with three pairs of very strong marginal setae (basals, subapicals, and strong crossed horizontal apicals); pteropleural seta absent (except in *Prosheliomyia* in which weak pteropleural always evident); fore coxa largely bare or fully haired on inner anterior surface; mid tibia with a *v* seta; hind coxa bare posterodorsally; hind tibia without a *pv* apical seta; upper surface of wing setulose at least on  $R_{4+5}$  half way to  $r-m$ , often veins  $R_1$  and  $Cu_1$  extensively setulose ( $R_1$  setulose along all its length in both genera occurring in Australia); cell  $R_5$  open to the wing margin; bend of vein  $M$  moderately sharp or rather evenly rounded, usually without  $M_2$  appendix; second costal sector haired ventrally; excavation of  $T_1 + 2$  variable, usually not quite reaching hind margin of tergite;

abdomen often with discal setae (discals present on T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub> in both Australian genera); sternites concealed.

Attention should be called to the spelling of the generic name *Halydaia*. This name in Tachinidae is usually spelled *Halidaya*, and this is reasonable from a common-sense point of view since the genus was named in honour of the dipterist Haliday. However, Egger (1856) was apparently under the impression that Haliday's name was spelt as 'Halydai' as he wrote 'Ich habe sie zu Ehren des englischen Dipterologen A. H. Halydai *Halydaia* genannt', and nowhere in the original description does the spelling Haliday or *Halidaya* appear. In this curious circumstance it is open to question how Article 32 (a) of the *International Code of Zoological Nomenclature*, 1961, applies, but *Halydaia* is held here to be a correct original spelling; Egger was in the belief, it appears from the publication, that Halydai was a correct spelling and the spelling of the generic name *Halydaia* was therefore *intentional* (and cannot be held to be an inadvertent error).

It is necessary to have it established beyond doubt that *Halydaia* is the correct spelling of the name of the Tachinid genus, because if not then the name *Halidaya* in tachinids enters into homonymy with *Halidaya* Rondani in the Sepsidae, which by unfortunate coincidence was published in the same year (1856) as *Halydaia* Egger. (It is not evident at present whether Egger's or Rondani's was the earlier of the two works, but as *Halydaia* Egger is held to be valid under the *Code* there is no homonymy with *Halidaya* Rondani and it is irrelevant which name is the prior one.)

#### KEY TO AUSTRALIAN GENERA OF THELARIINI

- 1 Antennae inserted at a level far below the eye middle (Text-fig. 36). Head in facial view with the eyes converging ventrally so that the facial region is narrower than the frons. Both sexes with 5 or 6 pairs of strong proclinate orbital setae (Text-fig. 36). Arista pubescent. Eyes so large that they reach the peristome and virtually obliterate the gena (Text-fig. 36). Scutellum without discal setae. Interfrontal area reduced, much narrower than a parafrontal. Fore coxa haired only on apical half of the inner anterior surface. Legs reddish yellow (except sometimes for dark tarsi) . . . . . ***HALYDAIA*** Egger
- Antennae inserted at the level of the eye middle (Text-fig. 35). Head in facial view with the eyes slightly or strongly diverging ventrally so that the facial region is wider than the frons. ♂ without proclinate orbital setae, ♀ with two pairs. Arista short plumose. Eyes large but not reaching to the peristome, gena distinct and about as wide as third antennal segment (Text-fig. 35). Scutellum with a pair of semi-recumbent discal setae. Interfontal area wider than parafrontal. Fore coxa haired on whole extent of the inner anterior surface. Legs black

***THELAIRA*** Robineau-Desvoidy

#### Tribe MINTHOINI

This is an Old World tribe containing a few genera of very slender tachinids with long narrow wings and elongate legs. A few New World forms have been placed in the tribe but it is doubtful whether they correctly belong. A curious feature of the group is the conspicuous flattening of the fore tarsi in the females;

usually the female fore tarsi are flattened and dilated laterally, but in a few forms (for instance the Australian *Minthoxia*) the flattening is from side to side only on the basal part with the apical segments flattened and widened dorsoventrally. The Australian fauna contains only two genera at present, *Sumpigaster* and *Minthoxia*; the first of these is a completely typical minthoine closely similar to the type-genus, *Mintho* Robineau-Desvoidy (from the Palaearctic and Ethiopian Regions), but the second has a facies rather different from typical minthoines and may resemble them at all only convergently. In the original description of *Minthoxia* it was placed in the Minthoini and compared with *Tachinodexia* Townsend (an Oriental genus very similar to *Sumpigaster*) and it seems best to retain *Minthoxia* in the Minthoini for the time being. *Minthoxia* is known only from Australia, but *Sumpigaster* (originally described from Queensland) occurs widely in the Oriental Region eastwards to New Caledonia and the Loyalty Islands. The genus *Megistogastropsis* Townsend occurs in Papua, but has not yet been found in Queensland; its occurrence there seems possible, however, and it is therefore included in the key to the Australian genera of Minthoini.

The main characteristics of the Minthoini are as follows. Eyes usually bare or almost so; parafacials bare; epistome flat; vibrissae about level with the epistomal margin; antennal axis level with or below the eye middle; arista pubescent or plumose; proboscis short, palpi fully developed; prosternum bare (except in *Minthoxia*), prosternal membrane bare; propleuron bare; two or three sternopleural setae; acrostichal setae almost always reduced to  $1 + 0$  or  $1 + 1$ ;  $2 + 3$  or  $3 + 3$  *dc* setae; pre-alar seta absent or minute; two or three *post ia* setae, *prst ia* seta usually absent; humeral callus almost always with two setae, occasionally a small third seta in addition; infrascapular hairs usually absent; pteropleural seta present, but fine; scutellum rather flattened, without preapical (discal) setae, marginal setae not exceeding three pairs (always without laterals); fore coxa largely bare on anterior surface or haired on outer half of anterior surface; mid tibia with a *v* seta (often very small); hind coxa bare posterodorsally, usually rather remote from abdominal base; hind tibia usually with distinct *pv* apical seta; upper surface of wing with a few minute setulae on base of  $R_{4+5}$ , veins otherwise bare; cell  $R_5$  open or short-petiolate; second costal sector bare or haired ventrally; bend of vein *M* varied, usually rather abrupt, with or without  $M_2$  appendix, sometimes gently rounded; wings usually very long, apical part of  $Cu_1$  shorter or much shorter than *m-cu*;  $T_1 + 2$  usually not excavate to hind margin; some abdominal tergites usually with discal setae; sternites (except basal sternite) concealed; abdomen usually very long and slender.

#### KEY TO AUSTRALIAN GENERA OF MINTHOINI

- 1 Eyes bare or virtually so. Prosternum bare. Acrostichal setae usually  $1 + 0$ , occasionally  $1 + 1$ . Three *post ia* setae (sometimes weak, middle one undeveloped in occasional specimen). Mid tibia with one *ad* seta. Very slender forms with elongate legs . . . . . 2
- Eyes conspicuously haired. Prosternum setulose. Acrostichal setae variable but numerous, at least  $2 + 3$ . Two *post ia* setae (both strong, wide apart). Mid tibia with two *ad* setae. Not such slender forms, legs (especially fore tarsi) robust . . . . . **MINTHOXIA** Mesnil
- 2 Abdomen with strong discal setae on last visible tergite ( $T_5$ ), similar to those on  $T_3$  and  $T_4$ . Arista plumose (Text-fig. 32). Second costal sector bare ventrally. Scutellum with two pairs of marginal setae (either basals or apicals or both present in addition to subapicals). Bend of vein *M* sharp, with or without  $M_2$  appendix. Pre-alar seta almost always completely absent **SUMPIGASTER** Macquart

- Abdomen without discal setae on T5. Arista pubescent. Second costal sector haired ventrally. Scutellum with only one pair of marginal setae (the subapicals), basal and apical setae absent. Bend of vein *M* forming an evenly rounded curve without trace of appendix. Pre-alar seta almost always present, though small.  
[Indonesia & New Guinea] . . . . . *MEGISTOGASTROPSIS* Townsend

### Tribe NEMORAEINI

This small tribe is confined to the Old World and contains only the genera *Nemoraëa* Robineau-Desvoidy (of which *Protonemoraëa* Baranov and *Dexiomima* Brauer & Bergenstamm are now treated as synonyms) and *Chaetolydella* Villeneuve. The latter genus is African and is not really distinguishable from *Nemoraëa*, as van Emden (1960) states, but this is not the place in which to establish synonymy. *Nemoraëa* is widely distributed throughout the Palaearctic Region (including Japan), Africa, and the Oriental Region, but until now has not been reported from Australia. One undescribed species is now known from New South Wales and Queensland; this species has a mainly orange-red abdomen and a black-and-yellow striped scutum and closely resembles *N. ornata* (Bigot) from the Oriental Region (it also has a superficial appearance very reminiscent of the New Zealand genus *Prothystricia* Malloch, which belongs in the local New Zealand tribe Occisorini). In New Guinea the *Nemoraëa* fauna contains at least four undescribed species, and there are some large and spectacular species still undescribed in the Oriental fauna.

The numerous species of *Nemoraëa* tend to fall into two moderately distinct categories, one containing species in which the whole surface of the lower calypter is haired and the second costal sector bare ventrally and the other containing species in which hairing of the upper surface of the lower calypter is confined to the outer edge and the second costal sector is haired below (the Australian species falls into the latter category). The name *Nemoraëa* strictly applies to the first group, and the names *Dexiomima* and *Protonemoraëa* to the latter group. Many intermediates exist, however, and the current treatment of all the forms as comprising the single genus *Nemoraëa* is appropriate; examples of intermediate species, falling between the two main categories, are *N. echinata* Mesnil from Burma in which the outer half of the lower calypter is haired, and *N. dotata* (Walker) from Celebes in which the lower calypter has hair only on the outer margin but in which the second costal sector is bare on its ventral surface.

The chief characters of the Nemoraëini are as follows. Eyes haired; parafacials bare; arista micropubescent; face usually with a distinctly raised central ridge which is rounded on its anterior surface (not forming a sharp carina); genal dilation bearing unusually strong setulae or even setae as strong as the peristomal setae (Text-fig. 38); epistome flat, invisible in profile; vibrissae level with or only very little above the level of the epistome; inner vertical setae crossed (sometimes subparallel in ♂); outer vertical setae unusually weak in ♀, often not differentiated from postocular row; palpi unusually dorsoventrally flattened, band-like; prosternum, prosternal membrane and propleuron bare; three *post ia* setae; 3 + 3 or 3 + 4 *dc* setae; two or three sternopleural setae; infrascapular hairs present or absent; pteropleural seta present; fore coxa completely haired, or almost so, on its inner anterior surface; mid tibia with a *v* seta; hind coxa bare posterodorsally; hind tibia with a small (rather

inconspicuous) *pv* seta; wing with only a few setulae basally on  $R_{4+5}$ , veins otherwise bare; cell  $R_5$  open to the wing margin; bend of vein  $M$  very sharp and with a conspicuous  $M_2$  spur vein or fold; second costal sector bare or haired below; abdominal  $Tr + 2$  excavate to its hind margin; ♂ hypopygium usually with some rather long strong setae visible in situ; sternites mainly or partly overlapped by tergites, but at least exposed at their apices.

### Tribe LESKIINI

This tribe is in much need of a reclassification of the genera on a world basis, as the faunae of the Old World and New World regions contain forms that are virtually indistinguishable yet have not been associated in the same genera. The rich Neotropical fauna has been subject to excessive generic splitting, which has badly obscured the relationships existing within this local fauna and has made it difficult to relate the South American leskiines with Old World forms. This is unfortunate, as even a casual comparison shows that species occur in the Pacific islands and Australia, for example, that appear to be congeneric with New World forms. Bezzi (1928) placed a Fijian species in *Sipholeskia*, and Curran's Australian species *Demoticus certima* is here placed in the same genus after comparison with the type-species of *Sipholeskia*. Another of Bezzi's (1928) Fijian species, '*Rhinomyobia*' *minuta*, is so closely similar to the Neotropical species *Myobiopsis diadema* (Wiedemann) that it ought perhaps to be assigned to *Myobiopsis* Townsend or one of the related South American genera, and the same comment applies to a small unidentified leskiine from Queensland that is exceedingly similar to *minuta* Bezzi (this species is run out in the key that follows as representing an unidentified genus).

In Australia and Tasmania the Leskiini are rather well represented, though at present most of the forms are undescribed and for several of them it is impossible at present to decide upon a suitable generic assignment. Six named and identifiable genera occur in the area, of which two are non-endemic (*Demoticoides* and *Sipholeskia*). The others – *Apatemyia*, *Toxocnemis*, *Exechopalpus* and *Rhinomyobia* – are endemic genera not found outside Australia and Tasmania (a careful comparison with Leskiini from other regions has shown that only *Rhinomyobia* has characters fitting closely with any extra-limital forms). Bezzi (1928) placed two Fijian species in *Rhinomyobia*, but Townsend (1939 : 300) is correct in stating that neither of them truly belongs in this genus; it may here be noted that Townsend (*loc. cit.*) is also right that *Rhinomyobia transversalis* Malloch is wrongly assigned to the genus (this species, from Queensland, is undoubtedly congeneric with '*Rhinomyobia*' *plumifera* Bezzi from Fiji but there appears to be no available generic name to apply to these species at present).

It is difficult to define the Leskiini with much precision, especially as the tribe contains a few species in which the prosternum is haired, or the propleuron is haired, and seemingly closely allied forms may or may not possess a *pv* apical seta on the hind tibia, and differ in the arrangement of the scutellar bristling. Typically, however, the tribe includes rather slender long-legged forms in which the epistome is projecting, the arista long-pubescent or plumose, the eyes bare, the *post dc* setae number three, the mediotergite lacks infrasquamal hairs, the scutellum has only two

pairs of strong setae, the bend of vein *M* lacks an appendage, cell *R*<sub>5</sub> is open to the wing margin or only just closed, and there are two or three *stpl* setae. Some forms occur, less typical of their tribe, that have hairy eyes, four *post dc* setae, infrasquamal hairs, and three pairs of scutellar setae. Pallid coloration and reddish yellow legs are rather commonly found in the group, and there is a tendency for the tibiae of the males of the really long-legged forms to become extremely slender and sinuous with associated reduction of the bristling (here it should be noted that the mid tibia in Leskiini appears always to possess a submedian *v* seta but that this is often extremely small in long-legged males).

The endemic genus *Exechopalpus* possesses extraordinarily long palpi, similar to those of the Neotropical genus *Spathipalpus* Rondani, and the proboscis itself is extremely slender. Throughout the Leskiini there is a marked tendency for the proboscis to be unusually slender, elongate, almost stylet-like, with the labellae correspondingly reduced, and even in forms in which the proboscis is short it is usually found that the mentum is parallel-sided in profile rather than convex on its lower edge.

The genus *Bezziomyiobia* Baranov from the Solomon Islands has not been found in Australia, but is included in the following key to genera to show its main features. It is extremely close to *Demoticoides* Mesnil, and the latter ought perhaps to be sunk as a synonym of *Bezziomyiobia* (it is beyond the scope of the present work to consider this further).

#### KEY TO AUSTRALIAN GENERA OF LESKIINI

- 1 Scutellum with only two pairs of strong marginal setae, the basals and subapicals; apical scutellar setae minute and hair-like or absent, if weakly developed then directed half-upwards. Subapical scutellar setae not inserted very widely apart, distance between their bases subequal to or less than that between a subapical seta and its corresponding basal seta . . . . . 2
- Scutellum with three pairs of strong marginal setae, a pair of strong horizontal crossed apical setae present in addition to the basals and subapicals. Subapical scutellar setae inserted *very* widely apart, distance between their bases about twice as great as that between a subapical seta and its corresponding basal seta (or even more than this) . . . . . 8
- 2 Palpi exceptionally elongate, length about equal to that of head at level of the epistome; palpi projecting beyond epistome by a distance about equal to the antennal length (when proboscis retracted). Fore tibia with some strong *ad* setae. Mid tibia with three or four strong *ad* setae and with three strong *p* setae. Hind tibia with a *pv* apical seta . . . . . **EXECHOPALPUS** Macquart
- Palpi normal, length conspicuously less than that of head at level of the epistome; palpi not or only a little projecting beyond epistome (when proboscis retracted) (Text-fig. 41). Fore tibia without *ad* setae (a few inconspicuous *ad* setulae on basal half in *Rhinomyobia*). Mid tibia with one or two *ad* setae and nearly always with two *p* setae (some *Toxocnemis*-like forms with a very small third *p* seta basad of the normal two). Hind tibia without a *pv* apical seta (except in *Siphopleskia*) . . . . . 3
- 3 Abdomen with T<sub>1</sub> + 2 excavate to its hind margin. Second costal sector bare ventrally. Humeral callus with three or more setae in line (sometimes not clearly differentiated from long hair). More robust forms with subovate or subconical abdomen . . . . . 4

- Abdomen with  $T_1 + 2$  excavate only on its basal half. Second costal sector haired ventrally. Humeral callus usually with only two strong setae (sometimes a weak third seta set forwards of main two or mesad of inner one of main pair). Slender forms with rather long narrow abdomen . . . . . 7
- 4 Pteropleuron with a strong pteropleural seta in addition to the hairing. Parafacials bare or at most haired only on upper half. Eyes bare or almost so. Infrascapular hairs absent. Arista bushy plumose or micropubescent . . . . . 5
- Pteropleuron without any seta in addition to the hairing. Parafacials fully haired. Eyes haired (hairing very short and sparse in some specimens). Infrascapular hairs present [careful examination needed]. Arista bushy plumose
- APATEMYIA** Macquart
- 5 Propleuron bare. Proboscis short, mentum shorter than eye-height and wider in profile than third antennal segment. Pleural regions of thorax with black hair. Hind tibia of both sexes with two *pd* setae . . . . . 6
- Propleuron haired. Proboscis very slender, mentum longer than eye-height and narrower in profile than third antennal segment. Pleural regions of thorax with yellowish white hair. Hind tibia of ♂ with one *pd* seta (unknown for ♀, possibly two *pd* in this sex) . . . . . **TOXOCNEMIS** Macquart
- 6 Parafacials totally bare. Arista with short bushy plumosity or long pubescence. Rows of frontal setae irregular at lower ends where frontal setae form a rather dense bunch on the profrons (especially in ♂). ♂ abdomen with long fine erect or semi-erect hairing. Intermediate abdominal tergites often with erect (rather variable) discal setae . . . . . Undetermined genus
- [Running out here is a complex of forms with exactly similar appearance in most respects to *Toxocnemis* (head profile as Text-fig. 43) but differing by the characters shown in the key, most notably by having the propleuron bare. This complex will either require a new genus or will need to be placed in *Toxocnemis* on a redefined basis]
- Parafacials haired on upper half or at least with a few hairs immediately below the lowest frontal seta. Arista micropubescent (appearing almost bare at first glance). Frontal setae in one regular row on each side, not duplicated into a bunch of setae on the profrons. ♂ abdomen with short recumbent hair. Intermediate abdominal tergites without discal setae . . . . . **RHINOMYOBIA** Brauer & Bergenstamm
- 7 Wing vein  $R_{4+5}$  completely bare. Proboscis short, mentum much shorter than eye-height. Hind tibia without *pv* apical seta. Vibrissae level with epistomal margin. Fore tibia without *pd* setae. Hind tibia with one *pd* seta. Undetermined genus
- [Running out here is an unidentified species seen from A.C.T. that cannot be satisfactorily assigned to a genus at present. The species is congeneric with '*Rhinomyobia*' *minuta* Bezzi from Fiji.]
- Wing vein  $R_{4+5}$  with several setulae on basal node and usually for some distance along the vein towards *r-m*. Proboscis long and very slender, mentum longer than height of the head. Hind tibia with a small *pv* apical seta. Vibrissae distinctly above level of epistomal margin. Fore tibia with some small *pd* setae or setulae distinct from the hairing. Hind tibia with two or more small *pd* setae . . . . . **SIPHOLESKIA** Townsend
- 8 Prosternum bare. Arista micropubescent. Eyes haired (hairing very short and inconspicuous in ♀). Abdominal  $T_5$  with a transverse discal row of very strong setae in addition to the apical row. Humeral callus with the three main setae distinctly arranged in a triangle . . . . . 9
- Prosternum setulose. Arista with long plumosity. Eyes bare. Abdominal  $T_5$  without a discal row of setae, only with apical setae. Humeral callus with the three main setae standing almost in a straight line . . . . . New genus
- [Running out here are *Rhinomyobia transversalis* Malloch from Queensland and *R. plumifera* Bezzi from Fiji, together with some unnamed forms from New

Guinea, none of which correctly belongs in the genus *Rhinomyobia*. There appears to be no described genus to which these species can be correctly assigned, and a new genus will probably be needed for their appropriate placement.]

- 9 Mid tibia with two *ad* setae. Legs and palpi dark brown. [Solomon Islands] *BEZZIOMYIOBIA* Baranov  
 - Mid tibia with one *ad* seta. Legs (except tarsi) and palpi reddish yellow. [India & Queensland] *DEMOTICOIDES* Mesnil  
 [This genus is so similar to *Bezziomyiobia* that the name ought perhaps to be treated as a synonym.]

### Tribe ERNESTIINI

Four endemic Australian genera are here placed in this tribe, but it is doubtful whether the placements of two of them, *Neximyia* and *Amphitropesa*, will be upheld by further work. The affinities of these two genera are very obscure, and the fact that they are so far known only from very few female specimens makes it specially difficult to determine their true relationships; *Neximyia* at least appears to be rightly placed in the Tachininae, and probably does truly belong somewhere near the ernestiine-linnaemyine complex, but *Amphitropesa* is much more problematical and may not really belong in the Tachininae at all (its total facies, much reduced dorsal thoracic bristling, and strongly clubbed female palpi give it some resemblance to certain Proseninae).

The placement of *Chlorotachina* in Ernestiini appears to be almost certainly correct. In all its characteristics it conforms to the Ernestiini as the tribe is recognized in the Eurasian fauna, and the dark metallic blue-black or metallic greenish blue appearance of most forms conforms with that of similar metallic forms in the Palaearctic Region. The genus *Macrochloria*, although not immediately obvious as an ernestiine, is best placed in the Ernestiini as its characters closely accord with those of *Chlorotachina*.

The main characteristics by which *Chlorotachina* and *Macrochloria* concur with Eurasian Ernestiini are as follows: epistome very prominent, vibrissae inserted well above epistomal margin; parafacials bare; palpi moderately well developed; eyes densely long-haired; three postsutural *ia* setae (cf. *Parerigonini*); scutellum with four pairs of very strong marginal setae; mid tibia with more than one *ad* seta and both sexes with a *v* seta (♂ lacking a *v* seta in typical *Parerigonini*); hind coxa bare posterodorsally; wing with bend of vein *M* very sharp and provided with at least a trace of an *M*<sub>2</sub> stump or spur vein.

The genera *Neximyia* and *Amphitropesa*, here placed as a temporary measure in this tribe, do not conform with all of these characteristics, as will be evident from the following key to genera.

#### KEY TO AUSTRALIAN GENERA OF ERNESTIINI

- |   |   |
|---|---|
| 1 Eyes densely haired. Presutural acrostichal setae well developed. Prosternum haired (except in occasional specimen of <i>Macrochloria</i> ). Wings clear hyaline . . . . .  | 2 |
| - Eyes bare (some very sparse short macroscopic hairs may be visible under high power). Presutural acrostichal setae absent or hair-like. Prosternum bare. Wings with the membrane partly brown and partly yellow . . . . . | 3 |

- 2 Upper half of face raised medially into a definite ridge-like or knob-like keel beneath the antennae, the keel easily visible when head seen in profile. Abdomen with dense white pollinosity on each side of the last visible tergite (T<sub>5</sub>), this tergite therefore contrasting in appearance with shining remainder of abdomen. Thoracic dorsum not shining . . . . . **MACROCHLORIA** Malloch
- Upper half of face slightly swollen medially but not raised into a keel, face therefore almost completely invisible in profile. Abdomen entirely shining, if some whitish pollinosity present then rather evenly distributed and very inconspicuous. Thoracic dorsum distinctly shining . . . . . **CHLOROTACHINA** Townsend
- 3 Parafacials bare. Propleuron bare. Wing with cell  $R_5$  open at the wing margin. Form with remarkable pattern, as follows: dorsum of thorax very pale greyish yellow with six large strongly contrasting black marks (sublateral pair on prescutum and a lateral and a sublateral pair on scutum); abdominal dorsum black on  $Tr + 2$  and T<sub>3</sub> (except for pair of pale greyish yellow marks anteriorly on outer edges of T<sub>3</sub>) and densely covered with pale greyish yellow pollinosity on T<sub>4</sub> and T<sub>5</sub>, T<sub>4</sub> with three bold black spots (median spot and a pair of lateral spots that continue round to ventral surface). Apical half of wing irregularly smoky brownish, the brown colour nowhere sharply contrasting with hyaline areas . . . . . **AMPHITROPEA** Townsend
- Parafacials haired (Text-fig. 45). Propleuron haired. Wing with cell  $R_5$  closed at or a little before the margin. Without such pattern, but marked as follows: dorsum of thorax with shining black prescutum and scutum contrasting with yellow or orange scutellum, humeral calli and notopleura, the pale areas with pale golden pollinosity; abdomen bright orange with a broad black fascia across the middle covering T<sub>4</sub> and apical part of T<sub>3</sub>, usually also three small black spots on T<sub>5</sub> and median depression of  $Tr + 2$  dark. Wing with a sharply defined but irregular brown cross-band, and with the membrane clear hyaline distally to the cross-band . . . . . **NEXIMYIA** Crosskey

### Tribe PARERIGONINI

This rare and aberrant group, first defined by Mesnil (1966 : 888), occurs in Eurasia, New Guinea and Australia. Its relationships with other tribes are at present very obscure, but the unusual modification of the male postabdomen, the unusual male genitalia, and the variously modified female terminalia, should shed some light on the true affinities when they are studied in detail. Superficially the New Guinea forms much resemble some Goniinae, and Australian forms like *Zita* have a general appearance, head facies and scutellar bristling much like some Proseninae; there is also some superficial resemblance to the Linnaemyini, mainly because of the prominent epistome and high vibrissae, and *Pygidimyia* has the colour and form much as in *Chaetophthalmus*. The Australian genera are known only from very few specimens, but these include representatives of some new species.

The main characteristics shown by the Australian Parerigonini are as follows. Epistome prominent and vibrissae inserted high above the epistomal margin; parafacials bare; genal dilation well developed; ♂ without proclinate orbital setae, ♀ with a pair of outwardly directed prevertical setae; inner vertical setae often convergent or crossing; upper occiput without black setulae behind the postocular row; prosternum bare; propleuron usually haired; humeral callus with three strong setae in a triangle, and one smaller seta set forwards of the inner two of the triangle; 3 (4) + 3 *dc* setae; 0 + 2 *ia* setae (the two *post ia* setae very strong and normally inserted in a position that suggests that a third *post ia* is never developed); three

or four *stpl* setae (2 + 1 or 3 + 1); infrascapular hairs present; pteropleural seta present or absent; mid tibia *without* a *v* seta in the ♂, with a *v* seta in the ♀ [this sexual difference apparently constant to judge from limited material seen]; hind coxa bare posterodorsally; hind tibia without *pd* preapical seta and without *pv* apical seta; wing with only a few weak hairs on basal node of  $R_{4+5}$ , veins otherwise bare; cell  $R_5$  open to the wing margin; bend of *M* rather abruptly angulate but without  $M_2$  spur or fold; abdomen of both sexes unusual, in ♂ T6 and T7 + 8 exposed and forming a conspicuous vertical declivity at the end of the abdomen, and in ♀ postabdomen strongly developed and recurved with elaborately modified ovipositor (sometimes resembling that of some Phasiinae such as *Cylindromyiini*); abdominal sternites exposed.

The strange genus *Australotachina* Curran does not completely conform with the characters cited above, as it has sparse black hairs on the upper half of the occiput, has four post *dc* setae, the ♂ has a submedian *v* seta on the mid tibia, there is an extra pair of scutellar setae, and the bend of vein *M* is rather gently rounded, but it seems nevertheless best to place it with the parerigonines until its affinities can be more reliably determined; its head profile is shown in Text-fig. 42.

#### KEY TO AUSTRALIAN GENERA OF PARERIGONINI

- 1 Scutellum with three pairs of very strong setae (basals, subapicals and crossed apicals). 0 + 2 *ia* setae. Propleuron usually haired. 3 + 3 *dc* setae (occasionally weak fourth *prst dc* seta) . . . . . 2
- Scutellum with four pairs of strong setae (a pair of enormous laterals present in addition to basals, subapicals and crossed apicals). 0 + 3 *ia* setae (a weak hair-like *post ia* seta present in front of the main two). Propleuron bare. 3 + 4 *dc* setae . . . . . **AUSTRALOTACHINA** Curran
- 2 Abdomen with T1 + 2 and T3 normal, not fused, with excavation of T1 + 2 reaching the hind margin. Barettte haired on anterior half. Posterior thoracic spiracle not exceptionally large, about as long as the barettte or only a little more. Both thoracic spiracles brown or blackish. Legs and all thoracic hair black . . . . . 3
- Abdomen with T1 + 2 and T3 fused into a single very large composite tergite in which the excavation is confined to the basal part. Barettte bare. Posterior thoracic spiracle exceptionally large, very much longer than the barettte. Both thoracic spiracles pale yellowish. Legs reddish yellow (except for apical darkening of the tarsi) and hair of sides of the thorax golden orange or yellow . . . . . **PYGIDIMYIA** Crosskey
- 3 Eyes densely and conspicuously hairy. Epistome usually only moderately prominent, vibrissae inserted above the epistomal margin by a distance not exceeding the length of the second antennal segment . . . . . **LEVERELLA** Baranov
- Eyes bare or almost so (at most only with very sparse inconspicuous and microscopic hairs). Epistome strongly projecting, subnasute, vibrissae inserted above the epistomal margin by a distance exceeding the length of the second antennal segment (Text-fig. 46) . . . . . **ZITA** Curran

#### Tribe LINNAEMYINI

The Linnaemyini include forms that are superficially very like the Tachinini but differ by having the dorsal surface of the hind coxa bare. All the Australian forms have the eyes densely haired, and this helps to separate them at a glance

from the Australian tachinines in which the eyes are always bare. Separate tribal status for Linnaemyini and Tachinini is in reality scarcely justified, but the Australian forms at least can be readily differentiated and separate tribal status is recognized for purposes of the present work. The following principal features are shared by the two groups: Epistome prominent or subnasute; vibrissae inserted well above level of epistomal margin; scutellum with similar bristling which usually includes erect subspiniform preapical setae; mid tibia with several *ad* setae and a submedian *v* seta; hind tibia with a *pv* apical seta; cell  $R_5$  open; bend of vein *M* sharp and provided with an  $M_2$  extension either as a definite spur vein or at least as a wing fold; pteropleural seta strong; abdomen with  $T_1 + 2$  excavate to its hind margin and with the sternites largely exposed; upper occiput without black setulae behind the postocular row.

Three genera are known from Australia, at least one of which (*Chaetophthalmus*) occurs also in Tasmania. This genus up to now was believed to be entirely Australian, but undescribed species are now available from New Guinea and New Caledonia. *Chaetophthalmus* is the dominant linnaemyine genus in Australia, and the other genera appear to be uncommon to judge from material so far known; one of these is the widespread Old World and North American genus *Linnaemya*, and the other is the monotypic genus *Apalpus* which is known only from South Australia and Western Australia. The three genera can only be reliably separated by the vestiture, or lack of vestiture, on the parafacials, and there is some doubt whether generic status is fully justified. It may be noted that they all have  $3 + 3$  *dc* setae (Text-fig. 61) and in this respect differ from the tachinines in Australia which all have  $4 + 4$  *dc* setae or more; the propleuron is always bare, and this character (as well as the hairy eyes) is useful in differentiating *Chaetophthalmus* from the tachinine genus *Microtropesa*, which has some superficial resemblance to it. All the Australian Linnaemyini have very reduced palpi.

#### KEY TO AUSTRALIAN GENERA OF LINNAEMYINI

- 1 Parafacials haired. Normally two *stpl* setae.  $0 + 3$  *ia* setae [*prst ia* seta probably sometimes occurs but has not been seen]. Epistome extremely prominent and nasute. Vibrissae inserted very high above the epistomal margin, distance from insertions to level of the epistomal margin as great as or greater than the length of the second antennal segment. Prosternal membrane and anterior part of prosternum usually finely haired (hairs if present may be pale and very inconspicuous). Abdomen rather rotund, appearing noticeably wider than thorax to naked eye . . . . . 2
- Parafacials bare. Normally three *stpl* setae.  $1 + 3$  *ia* setae [*prst ia* seta probably sometimes absent]. Epistome prominent but not strikingly nasute. Vibrissae inserted above the level of the epistomal margin by a distance less than the length of the second antennal segment. Prosternal membrane and prosternum bare. Abdomen more elongate, not noticeably wider than thorax to naked eye

**LINNAEMYA** Robineau-Desvoidy

- 2 Parafacials without any strong setae in addition to the hairing (Text-fig. 44)

**CHAETOPHTHALMUS** Brauer & Bergenstamm

- Parafacials each with one strong incurved seta near the lower end in addition to the hairing (see fig. 17 in Malloch, 1929b : 316) . . . . . **APALPUS** Malloch

## Tribe TACHININI

In Australia the Tachinini are represented mainly by the endemic genus *Microtropesa*, which is readily distinguished from other tachinine (except *Paratropeza* Paramonov) genera by the possession of long dense hair on the pleurotergite (the supraspiracular convexity just dorsal to the hind thoracic spiracle). This genus includes several distinctive species with patterned abdomen and smoky brown and yellow wings, but also some species of more humdrum appearance. The only two other genera known in Australia are non-endemic, *Cuphocera* occurring very widely throughout the Old World and *Eristaliomyia* in the south-east Asian archipelago, Malaya and New Guinea (the latter genus is probably confined in Australia to the Northern Territory and Queensland); *Eristaliomyia*, it should be noted, is very closely allied to the genus *Servillia* Robineau-Desvoidy (which is abundantly represented throughout the Oriental Region) and perhaps ought not to be recognized as a valid genus. In general, the tachinine fauna of Australia is rather impoverished, in contrast to that of the Palaearctic and Oriental Regions where it is so richly developed.

The genera represented in Australia have the following features in common that aid in tribal recognition. Parafacials covered with long fine hair; second antennal segment unusually elongate (and the third not or hardly longer than the second); vibrissae inserted far above epistomal margin; eyes bare; epistome very strongly projecting; prosternum bare; 4 + 4 *dc* setae (Text-fig. 62) (sometimes with additional *dc*); scutellum often with erect spiniform setae or setulae just before the apex; no infrascapular hairs; mid tibia with many *ad* setae and with a *v* seta; hind tibia with a strong *pv* apical seta; hind coxa haired on the posterodorsal surface; basal node of  $R_{4+5}$  with only a few weak hairs, veins otherwise bare; second costal sector bare below; cell  $R_5$  open; strong pteropleural seta (often doubled); abdomen with  $T_1 + 2$  excavate to hind margin; abdominal sternites exposed and bearing stiff, often spiniform, setae; bend of vein *M* abrupt and with a weak fold extending at least slightly from the bend towards the wing margin.

## KEY TO AUSTRALIAN GENERA OF TACHININI

- 1 Parafacials without strong setae in addition to the hair. Propleuron haired. 1 + 2 *ia* setae. Palpi well developed (though sometimes very slender). ♂ without proclinate orbital setae . . . . . 2
- Parafacial armed with two or three strong setae (standing on lower end near the eye). 1 + 3 *ia* setae. Palpi vestigial. ♂ with or without proclinate orbital setae  
**CUPHOCERA** Macquart
- 2 Convexity above posterior thoracic spiracle (pleurotergite) bare. Three strong supra-alar setae. One sternopleural seta [0 + 1 *stpl* in specimens seen, possibly not constant]. Parafrontals shining black. Forms with bee-like facies and unusually short wings . . . . . **ERISTALIOMYIA** Townsend
- Convexity above posterior thoracic spiracle (pleurotergite) with dense vestiture of long hair. Two or three sternopleural setae. Parafrontals yellow to dark reddish orange. Forms without such facies and with wings not unusually short in relation to body size . . . . . **MICROTROPESA** Macquart

## SUBFAMILY GONIINAE WITH KEYS TO THE TRIBES AND GENERA

This enormous subfamily includes the forms commonly thought of as the 'higher Tachinidae', and many of them have the pre-alar seta very large; this character

appears clearly to be a derived (apomorphic) one, and is not found to the same degree elsewhere in the Tachinidae. Some authors have in the past recognized two subfamilies within the group, the Exoristinae (= Tachininae sensu van Emden) with a small pre-alar seta, and the Goniinae with a large pre-alar seta, but specialists now seem agreed that it is only justified to recognize all as a single subfamily (Goniinae); the group as a whole is rather uniform in the genital structure of the males and intermediate forms exist between the more typical elements of the exoristines and the goniines on external characters. The external facies within the Goniinae is extremely diverse, though not to the extent shown by the Tachininae, and it is not easy to define the subfamily (especially as it is not unified by parasitizing only one order of insects, the hosts including forms as diverse as adult beetles, larval Lepidoptera and grubs of paper-making wasps). Nevertheless the following characteristics of the external adult morphology are typical of the subfamily and help towards defining it.

Head without a facial carina; head of ♂ never holoptic and uppermost eye facets not enlarged; rows of frontal setae descending usually to about on a level with the middle of the second antennal segment; reclinate orbital setae nearly always present, ♀ rarely with outwardly directed prevertical setae; inner vertical setae normally subparallel (very rarely crossing); vibrissae well developed; arista normally micropubescent, rarely plumose; palpi almost always fully developed (papilliiform in some species of *Stomatomyia*, *Spoggosia*, etc.); thoracic and abdominal chaetotaxy usually strongly developed; prosternum haired or setulose (bare in a few forms, especially in Blondeliini); prosternal membrane bare; humeral callus with two or more setae; at least 2 + 2 *dc* setae, usually more; normally three *post ia* setae (two only in a few forms or aberrant specimens); pre-alar seta present, small or large; two or more *sa* setae, though hind one sometimes weak; postalar callus with two setae; scutellum with at least two pairs of marginal setae; 2-4 (5) *stpl* setae; infrasquamal hairs almost always absent (present at least in a few Blondeliini); fore coxa bare on much of its inner anterior surface; mid tibia with or without a submedian *v* seta; hind coxa almost always all bare posterodorsally, but a few forms (such as many *Carcelia* spp.) with one or two fine setulae; hind tibia almost always without *pv* apical seta, usually with two dorsal preapical setae but sometimes with a *pd* preapical seta in addition; abdomen with T1 + 2 excavate to its hind margin (a few exceptions including all Siphonini); sternites of the abdomen normally concealed or mainly so; hair of lower half of the occiput and the postbuccae always pale.

Some of the tribes here accepted are very weakly defined and probably ought not to be recognized as valid, but it is best to treat them as valid until a better classification can emerge from a large-scale study on a world basis using new or improved criteria. This comment applies particularly to the Carceliini, Sturmiini, Winthemiini and Eryciini, which merge rather imperceptibly into one another and are only separable on rather unconvincing grounds.

Herting (personal communication) considers that the multifarious genera of the Goniini-Carceliini-Sturmiini-Eryciini complex should be aggregated into two tribes (for which the names Eryciini and Goniini would be nomenclaturally correct) according to whether they have an ovarviparous or a microoviparous reproductive habit. Such a course has much to commend it insofar as it would probably reflect the real phylogeny more accurately than the present tribal system. But it is impossible to adopt such a system as yet for the Australian fauna, in which the reproductive habit of most of the genera remains unstudied. Furthermore,

a separation into two tribes on the basis of the reproductive habit presents practical difficulties of identification (since the external adult morphology of the genera included in the redefined Goniini and Eryciini would not allow clear diagnosis, nor would it lend itself to tribal key construction).

#### KEY TO AUSTRALIAN TRIBES OF GONIINAE

- 1 Pre-alar seta long and strong, longer than the first *post ia* seta and usually longer than the first *post dc* seta (except in *Bactromyiella*). Sternopleuron often with four *stpl* setae. Second costal sector bare ventrally. Subapical scutellar setae never converging to enclose the apicals . . . . . 2
- Pre-alar seta small and weak, shorter than the first *post ia* seta (except in *Phorocerosoma*) and normally much shorter than the first *post dc* seta. Second costal sector bare or haired ventrally. Sternopleuron with fewer than four *stpl* setae. Subapical scutellar setae sometimes convergent and enclosing the apicals . . . . . 7
- 2 Ocellar setae reclinate. Scutellum with a pair of stiff erect divergent preapical setae. Frons very wide in both sexes, ♂ with outer vertical setae like the ♀. Eyes bare. 3 + 4 *dc* setae . . . . . **GONIINI** (p. 96)
- Ocellar setae proclinate or absent (slightly divaricate in *Paragonia*). Scutellum usually without stiff erect preapical setae just before the tip. Frons usually not exceptionally wide, ♂ rarely with distinct outer vertical setae. Eyes bare or haired. Various complements of *dc* setae . . . . . 3
- 3 Eyes relatively very large so that the gena is reduced to a narrow strip below the eye that is not as wide as the profrons (Text-figs 48, 52 & 53) . . . . . 4
- Eyes occupying relatively less of the side of the head, gena usually at least slightly wider than the profrons (when doubtful check *Winthemiini*), often conspicuously so (Text-figs 50 & 51) . . . . . 5
- 4 Propleural seta present. Legs blackish brown or mainly so, basicosta usually dark (yellowish in a few forms). [Parasites of Lepidoptera] . . . . . **CARCELIINI** (p. 89)
- Propleural seta absent (except in *Koralliomyia*). Legs uniformly pale orange-yellow or at most only femora brown, basicosta clear yellow-orange. [Parasites of vespid wasps] . . . . . **ANACAMPTOMYIINI** (p. 90)
- 5 Barette completely haired. Humeral callus with five strong setae (at least in the ♂) of which the three main ones stand in a triangle. Eyes densely haired. Hind tibia of ♂ with a long close-set *ad* fringe. ♂ without definite reclinate orbital setae. Scutellum with strong horizontal crossed apical setae *and* with the subapical setae inserted far apart (distance between their bases at least as great as that between a subapical seta and its corresponding basal seta) (Text-fig. 72) . . . . . **WINTHEMIINI** (p. 88)
- Barette only haired at its anterior end (some exceptions: fully haired in *Bactromyiella*) or entirely bare. Humeral callus with fewer than five setae, normally three setae in a straight line and a fourth seta set forwards of the basal line of three (sometimes only three setae in line or in a triangle). Eyes bare or haired. Hind tibia with or without such fringe in the ♂. Arrangement of scutellar setae varied, as above only in a few *Sturmiini* . . . . . 6
- 6 Vibrissae inserted at a level distinctly above the epistomal margin (rarely only slightly above). Always 3 + 4 *dc* setae. Inner posterior angle of the lower calypter well developed, and inner margin of lower calypter abutted closely against the scutellum. ♂ often with well developed close-set *ad* fringe on hind tibia and sometimes with dense secondary sexual hair fascicles on venter of abdominal T<sub>4</sub> . . . . . **STURMIINI** (p. 91)

- Vibrissae usually inserted about on a level with the epistomal margin (if above then other character not fully fitting or doubtfully so). Dorsocentral setae sometimes 3 + 4 but other complements occurring. Inner margin of lower calypter usually not closely following edge of scutellum, inner posterior angle of the calypter usually rather rounded. ♂ without a regular close-set hind tibial fringe and without abdominal hair fascicles . . . . . **ERYCIINI** (p. 96)
- 7 Scutellum with three pairs of very strong setae in which the apical setae are crossed and horizontal and the subapical setae are very wide apart and inserted well forwards on the sides of the scutellum (Text-fig. 68); no lateral scutellar setae. Basal node of  $R_{4+5}$  with one strong setula. Parafrontals in both sexes with a long series of strong proclinate orbital setae. Antenna with the anterior tip of the third segment forming a sharp point. Bend of vein  $M$  widely obtuse,  $M_1$  unusually straight and cell  $R_5$  normally closed at the wing margin or short petiolate (Text-fig. 88). Second costal sector haired ventrally. 2 + 3  $dc$  setae. [Parasites of Orthoptera Acridoidea] . . . . . **ACEMYINI** (p. 78)
- Scutellum almost always with different conformation of setae, lateral setae usually present; if scutellar bristling similar then other characters not fitting. Basal node of  $R_{4+5}$  with more than one isolated setula (except in Neaerini and a few Blondeliini). Parafrontals with the usual two pairs of proclinate orbital setae in ♀, without or with two pairs in ♂. Antenna not noticeably mucronate, outer tip of last segment usually rounded. Wing venation of different form (slightly similar in some Blondeliini). Second costal sector haired or bare below. Varied complements of  $dc$  setae. [Not parasites of Orthoptera Acridoidea, except possibly *Phorocerosoma*] . . . . . 8
- 8 Subapical scutellar setae strongly convergent or crossing at their apices (Text-figs 67 & 69). Second costal sector haired below (third sector also usually haired ventrally on most of its length). Costal margin conspicuously broken and incised at the apex of the subcosta ( $Sc$ ) (Text-figs 86 & 89). Abdominal  $Tr + 2$  not excavate to its hind margin . . . . . 9
- Subapical scutellar setae parallel to each other or diverging (e.g. as in Text-fig. 71). Second costal sector bare below (except in *Lixophaga*). Costal margin inconspicuously broken and scarcely at all incised at the apex of  $Sc$ . Abdominal  $Tr + 2$  usually excavate to its hind margin (not in some Blondeliini or in *Hillomyia*) . . . . . 10
- 9 Abdomen without discal setae on any tergite. Propleuron bare. Head not sexually dimorphic, ♂ with two pairs of proclinate orbital setae and with outer vertical setae like the ♀. Vein  $R_{4+5}$  extensively setulose and  $R_1$  usually also partly or wholly setulose. Eyes bare. Hind tibia with three dorsal preapical setae ( $pd$  preapical present in addition to the usual  $ad$  and  $d$  preapicals) (Text-fig 18) . . . . . **SIPHONINI** (p. 80)
- Abdomen with strong erect discal setae on tergites 3 to 5. Propleuron haired. Head sexually dimorphic, frons much narrower in ♂ than ♀ and male head without proclinate orbital setae or definite outer vertical setae. Vein  $R_{4+5}$  with one setula only or a small tuft of setulae confined to the basal node,  $R_1$  bare. Eyes haired (but hairing very short and inconspicuous in some forms). Hind tibia with two dorsal preapical setae (the normal  $ad$  and  $d$  preapicals) (Text-fig. 19) . . . . . **NEAERINI** (p. 78)
- 10 Bend of vein  $M$  in the form of an open evenly rounded curve (as in Text-fig. 85) or if slightly abrupt then forming a widely obtuse angle, always without trace of an  $M_2$  appendix or fold. Propleuron bare or haired. Infrascapular hairs present or absent. Abdominal  $Tr + 2$  excavate or non-excavate to its hind margin. Mid tibia with or without a submedian  $v$  seta . . . . . **BLONDELIINI** (p. 81)
- Bend of vein  $M$  abrupt and not forming a widely obtuse angle ( $M$  changing direction usually at about 90° at the actual bend), often provided with an  $M_2$  appendix or

- fold in the wing surface (Text-fig. 87). Propleuron bare (except in *Hillomyia*). Prosternum always haired or setulose. Infrascapular hairs always absent. Abdominal  $Tr + 2$  excavate to its hind margin (except in *Hillomyia*). Mid tibia always with a submedian  $v$  seta . . . . . II
- II Lower calypter normal, outer edge not bent downwards. Bend of vein  $M$  nearly always with at least a trace of an  $M_2$  appendix or at least a darkened fold in the wing membrane continuing towards the wing margin (Text-fig. 87). Eyes bare or haired. Three or four *post dc* setae. Barete usually haired only at its anterior end . . . . . **EXORISTINI** (p. 85)
- Lower calypter bent abruptly downwards on its outer margin (except in *Mycteromyiella*). Bend of vein  $M$  without trace of  $M_2$  appendix or fold. Eyes densely haired. Four *post dc* setae. Barete fully haired. . . . . **ETHILLINI** (p. 87)

### Tribe **ACEMYINI**

This is a small but nearly cosmopolitan tribe in which all the known hosts are Orthoptera of the families Acrididae s.l. and Eumastacidae. The scutellar bristling is distinctive among the Goniinae (Text-fig. 68) and comprises three pairs of very strong setae, an apical crossed pair, a subapical pair set unusually far forwards on the sides of the scutellum and a basal pair. Most forms have a long series of proclinate orbital setae in both sexes and many have the outer tip of the third antennal segment formed into a rather sharp point, these features helping towards instant recognition of the group; the basal node of vein  $R_{4+5}$  has only one extremely strong setula on both surfaces of the wing, a feature that is relatively uncommon in goniines, although found in the Neaerini. Only the single genus *Ceracia* Rondani (syn. *Myothyria* Wulp) is known in Australia, and this is distinguished from other acemyine genera by the following combination of characters: prosternum setulose; head with proclinate orbital setae in both sexes; hind tibia without  $pv$  apical seta (cf. *Acemya* Robineau-Desvoidy); humeral callus with three setae; cell  $R_5$  closed at or just before the wing margin (Text-fig. 88); two sternopleural setae; bend of vein  $M$  rather abrupt and very remote from wing margin (Text-fig. 88);  $2 + 3$  *dc* setae; vibrissae above the level of the epistomal margin; basicosta reddish yellow; third antennal segment distinctly mucronate; head with inner eye margins strongly diverging ventrally, parafacials not or hardly contracted at their lower ends.

### Tribe **NEAERINI**

The Australian fauna contains several little known forms that are clearly very closely allied to the genus *Tongamyia* Mesnil from Tonga and Fiji, and the resemblance is indeed so complete that *Voriella* Malloch and *Tongamyia* ought probably to be placed as synonyms (this is not considered further in the present work as *Voriella* is the older name and would not have to be changed in the event of synonymy). It is pertinent, however, that Mesnil (1960 : 649, footnote) associates *Tongamyia* with the neaerines and the genus *Neaera* Robineau-Desvoidy, and placement of *Tongamyia* in the Neaerini appears very reasonable on present evidence. As *Voriella* is virtually indistinguishable from *Tongamyia* it, too, is here assigned

to Neaerini. (The only noteworthy difference between *Voriella* and *Tongamyia* lies in the vestiture of the hind coxa, as indicated in the key that follows.)

*Voriella* and its allies have the following main features in common. ♂ without proclinate orbital setae and with such fine straight reclinate orbital setae that they appear to form a continuous row with the frontal setae; ♀ with one pair of reclinate orbital setae (sometimes slightly twisted outwards); vibrissae level with epistomal margin; frontal setae descending far down on the parafacials (sometimes to a level below the mid-point) and in ♂ the rows irregularly duplicated at the lower ends; upper occiput with some black setulae behind postocular row; normally 2 + 3 *dc* setae (3 + 3 occurring, perhaps aberrantly); 1 + 3 *ia* setae; 2 *stpl* setae; scutellum with only two pairs of strong setae, the basals and subapicals, the latter meeting or crossing at their tips; propleuron haired; infrascapular hairs absent; mid tibia with a submedian *v* seta; mid tibia with one or two *ad* setae; hind tibia without *pd* preapical seta and with or without a very small *pv* apical seta; second costal sector haired ventrally; costal spine long; distance on vein *M* from bend to *m-cu* as great, or nearly so, as that from *m-cu* to *r-m* (Text-fig. 86); costa of ♂ often with long fine ventromarginal hair on basal part; basal node of  $R_{4+5}$  most often with only one strong setula above and below, sometimes with a hair tuft; abdomen with  $T_1 + 2$  not excavate to hind margin and with very strong erect discal setae on  $T_3-T_5$ .

In addition to the type-species, Malloch described two other Australian species (viz. *inconspicua* and *armiceps*) that he placed in *Voriella*; neither correctly belongs in the genus or in the Neaerini.

An undescribed species with haired parafacials has been seen from South Australia, and another with the characters of *Tongamyia* but with 3 + 3 *dc* setae has been seen from New South Wales. Both differ slightly from either *Voriella* or *Tongamyia* and their generic placement is uncertain at present. They have been placed, however, in the following key so that the differential features can be seen easily. There are evidently more forms yet to be discovered in Australia in this interesting and little-known complex. Probably when studied sufficiently it will be concluded that all should be treated as congeneric, and the definition of *Voriella* widened accordingly.

The BMNH collection contains an undescribed species of Neaerini from Queensland that differs from all the other Australian Neaerini so far known by having the wing cell  $R_5$  exceedingly long-petiolate. This species is very small (length only about 2.5 mm) but differs from *Tongamyia* only by the petiolate cell  $R_5$ . The species will either require a new genus (if the long petiole is considered a sufficient generic character) or will have to be placed in *Tongamyia* with the necessary widening of the definition of the latter.

The affinities of the Neaerini appear to lie with the Siphonini, a tribe which Herting (personal communication) considers should be assigned to the Tachininae. Future work may well demonstrate that the neaerines also should be placed in the Tachininae, and possibly also that the tribe should be merged with the Eloceriini (=Helocerini of authors). In the latter event the correct tribal name would be Eloceriini.

#### KEY TO AUSTRALIAN GENERA OF NEAERINI

- 1 Wing with cell  $R_5$  closed far before the wing margin, the petiole very long (longer than either the second costal sector or  $M_1$ ) [Queensland] . . . Undescribed sp., ? gen. n.

- Wing with cell  $R_5$  open or at most only just closed at the wing margin . . . . . 2
- 2 Parafacials with a row of strong black hairs or setulae (curving downwards). Basal node of vein  $R_{4+5}$  with several long hairs or fine setulae on upper and lower surfaces, those of lower surface often forming a definite tuft [South Australia] Undescribed sp., ? gen. n.
- Parafacials bare (apart from the strongly descending frontal setae). Basal node of vein  $R_{4+5}$  usually with only one long strong setula on upper and lower surfaces, at most only two minute hairs in addition to the main setula . . . . . 3
- 3 Mid tibia with one submedian *ad* seta. Hind coxa bare on posterodorsal margin. 2 + 3 *dc* setae [Fiji, Tonga, Samoa] . . . . . *TONGAMYIA* Mesnil
- Mid tibia with two *ad* setae (a definite small *ad* seta present just basad of the main one). Hind coxa bare or setulose on posterodorsal margin. 2 + 3 or 3 + 3 *dc* setae [Australia] . . . . . 4
- 4 Hind coxa with black setulae on the posterodorsal margin. 2 + 3 *dc* setae. Fore tibia with two *pv* setae (basal one weak) [widespread eastern Australia] *VORIELLA* Malloch
- Hind coxa bare on the posterodorsal margin. 3 + 3 *dc* setae (a third *prst dc* seta present between the main two and almost equally strong: ? aberrant). Fore tibia with one *pv* seta [may not be constant when more material known] [New South Wales] . . . . . Undescribed sp.

## Tribe SIPHONINI

### (Actiini)

The cosmopolitan tribe Siphonini is the most distinctive in the Goniinae, and the Australian forms can be instantly recognized by their characteristic facies. This derives primarily from the following features: size very small (length about 3–4 mm, smallest Australian Tachinidae on average); head not sexually dimorphic (the sexes therefore rather difficult to recognize as both males and females have an equally broad frons, two pairs of proclinate orbital setae and strong outer vertical setae); scutellum with subapical setae convergent and usually crossing towards the tips (Text-fig. 67); pre-alar seta minute; legs rather short and with rather stiff setae (hind tibia unusual in having three strong preapical setae on upper surface – i.e. *ad*, *d* and *pd* preapicals – as shown in Text-fig. 18); abdomen without discal setae on any segment and with  $Tr + 2$  excavate only on its anterior half; wings short and broad with costal margin deeply incised at apex of *Sc* and with bend of vein *M* unusually remote from cross-vein *m-cu* (Text-fig. 89); wing veins more extensively setulose than in other goniines.

The Australian distribution includes Tasmania, and there are three genera represented in the area. The most notable absentee is the genus *Siphona* Meigen, which although represented by at least one species in New Guinea has not yet been found in Australia. This genus is not included in the key as, if found later in Australia, it will be immediately recognisable by the extremely long slender angled proboscis that is at least as long as the head height (all genera known in Australia have a short inconspicuous proboscis).

It is necessary to note here some changes in nomenclature of Australian siphonines. Crosskey (1966b) applied the generic name *Strobliomyia* Townsend to several Australian species, using the nomenclature given by Mesnil (1963). Mesnil noted two older names for *Strobliomyia*, viz. *Herbstia* Robineau-Desvoidy and *Peribaea* Robineau-Desvoidy, but considered that they were both preoccupied and therefore that *Strobliomyia* was the valid name. Mesnil was right about *Herbstia* Robineau-

Desvoidy which is preoccupied by *Herbstia* Edwards but wrong about *Peribaea* which is not preoccupied. The valid name for the genus previously called *Strobliomyia* is now, therefore, *Peribaea*. Mesnil (1963: 803) placed the names *Schizoceromyia* Townsend and *Schizactiana* Curran as synonyms of *Strobliomyia* (= *Peribaea*) but these synonymies are in error; the type-species of *Schizoceromyia* and *Schizactiana* have been examined, and neither has the strong downwardly directed prostigmatic seta that characterises *Peribaea*; on the contrary, both type-species have all the essential characters of *Ceromya* Robineau-Desvoidy, and the names *Schizoceromyia* and *Schizactiana* are therefore moved into new synonymy with *Ceromya*.

Some species of *Peribaea* have the third antennal segment deeply cleft in the male, and a bifid male third antennal segment occurs in *fergusoni* Bezzi and *valida* Curran (the type-species of *Schizoceromyia* and *Schizactiana* respectively). Mesnil's placement of *Schizoceromyia* and *Schizactiana* in synonymy with *Peribaea* (as *Strobliomyia*) was evidently due to this feature – as the type-species were known to him only from descriptions, which did not mention the prostigmatic setae. It is now clear that forms with bifid or ramose male third antennal segments occur in both *Peribaea* and *Ceromya* – and indeed also in *Actia* (in which *A. baldwini* is one such species). Cleaving of the third antennal segment is extremely rare in the Australian tachinid fauna, and these siphonines are the only described Australian forms in which such a characteristic occurs.

The Siphonini are here placed in their traditional position, but there are reasons for thinking that they would be better placed in the Tachininae – notably certain features in the larval morphology (Herting, personal communication).

#### KEY TO AUSTRALIAN GENERA OF SIPHONINI

- 1 Thorax with two strong subequal prostigmatic setae, one directed upwards and the other downwards (Text-fig. 8). Wing with sixth vein extending to wing margin. Mid tibia with one strong *ad* seta . . . . . **PERIBAEA** Robineau-Desvoidy
- Thorax with one strong prostigmatic seta, directed upwards. Wing with sixth vein usually stopping short of wing margin (occasionally traceable to margin as weak fold). Mid tibia with or without an *ad* seta . . . . . 2
- 2 Sternopleuron with a regular row of fine hairs in front of the mid coxa (Text-fig. 15). Lowermost sternopleural seta very weak and placed about as far from the mid coxal base as from the upper anterior sternopleural seta [condition not known for all included species] . . . . . **ACTIA** Robineau-Desvoidy
- Sternopleuron completely bare laterally in front of the mid coxa. Lowermost sternopleural seta either very strong and placed very near the mid coxal base or (in *fergusoni*) undeveloped so that there are only two sternopleural setae [condition not known for all included species] . . . . . **CEROMYA** Robineau-Desvoidy

#### Tribe BLONDELIINI

This tribe contains a very large number of genera each with relatively few species. There is great diversity of body form and chaetotaxy within the group, but it is usually possible to recognize the blondeliines reliably among the gonines by the possession of three main features in combination, viz. pre-alar seta small or minute

(weaker than first *post ia* seta), subapical scutellar setae extremely strong and divergent (with the apicals very weak and often absent) (Text-fig. 71), and the bend of vein *M* forming an evenly rounded curve (Text-fig. 85). Some forms occur that do not completely fit with these criteria, but they are nevertheless very helpful in practical recognition of the group; some forms may have fairly well developed apical scutellar setae, and a very few (such as the Australian *Paropsivora*) have a rather abruptly angulate vein *M*. The tribe is nearly cosmopolitan, and is well represented in Australia and Tasmania (whence many undescribed forms exist in collections in addition to the identifiable genera and species). The hosts of many blondeliines are beetles or sawfly larvae, insect groups that much less commonly provide hosts for the other tribes of Goniinae.

Some of the Blondeliini with black coloration and slender elongate bodies and legs are strongly reminiscent of the Minthoini and it seems possible that there is a much closer affinity between blondeliines and minthoines than has been supposed or that some forms are erroneously classified in the Blondeliini (e.g. the tropical genus *Eophyllophila* Townsend). This genus occurs in New Guinea but has not been found in Australia, but black-and-yellow forms of the genus *Trigonospila* (which is evidently a close relative of *Eophyllophila*) are found in Australia. Other blondeliines, such as *Froggattimyia*, have very much the facies of Sturmiini and the existence of such forms as well as minthoine-like forms in the same tribe makes it difficult for the non-specialist to recognize the tribe on general appearance; but at least virtually all the members, whatever their naked-eye facies, share the three main characteristics already noted.

Another noteworthy character found in many blondeliines is hairing on the propleuron. This occurs in several quite different groups of blondeliines, but almost never in other tribes of Goniinae (in which the propleuron is bare except in *Hillomyia*). It is therefore a useful rule-of-thumb when identifying Australian tachinids that any goniine specimen with a haired propleuron belongs in the Blondeliini. The Australian fauna is rich in forms with haired propleuron and contains one notoriously difficult complex in which the supposed genera merge rather imperceptibly into one another. This complex includes *Anagonia* and related forms and is currently under study by Dr Donald Colless.

Very nearly all species of the enormous subfamily Goniinae have the prosternum haired or setulose (or at least one pair of prosternal setulae) but some blondeliines are atypical members of the Goniinae and have the prosternum totally bare. In Australia such forms include the genera *Trigonospila* and *Zosteromeigenia*, which (excepting rare aberrant specimens of other genera) are the only Australian Goniinae, apart from the sturmiine genus *Blepharella*, to have a bare prosternum.

About half of the genera of Blondeliini so far known from Australia are endemic, but this proportion is likely to rise when the fauna is better known. The non-endemic genera occur widely in Eurasia and at least two (*Compsilura* and *Trigonospila*) are found also in tropical Africa. *Lixophaga* is mainly a New World genus but has at least two species (one undescribed at present) in New Guinea; the described species, *L. sphenophori*, was introduced into Queensland and is apparently established there. The New Guinea blondeliines have not been worked out, but the genera

*Eophyllophila* Townsend and *Prodegeeria* Brauer & Bergenstamm certainly occur in the territory and may perhaps be found ultimately in Queensland.

The genus *Bactromyiella* is very anomalous, but may perhaps be a blondeliine. It has a small *pra* seta (smaller than the first *post ia* seta) and the bend of vein *M* is evenly rounded as in typical Blondeliini, but the subapical scutellar setae are parallel (not strongly divergent as is usual in blondeliines); the facies of *Bactromyiella* is not especially blondeliine, but is more that of a winthemiine or eryciine. The genus is kept tentatively in the Eryciini but is included also in the following key to blondeliine genera.

## KEY TO AUSTRALIAN GENERA OF BLONDELIINI

- 1 Mid tibia without a submedian *v* seta . . . . . 2
- Mid tibia with a submedian *v* seta . . . . . 3
- 2 3 + 4 *dc* setae. Prosternum haired. Scutellum with subparallel subapical setae and with apical setae. Intermediate abdominal tergites without discal setae. ♂ with velvety black thorax contrasting with bright orange or orange-red abdomen (except *Tr* + 2 black) . . . . . [**BACTROMYIELLA** Mesnil, tribe Eryciini]
- 2 + 3 *dc* setae. Prosternum bare. Scutellum with widely diverging subapical setae and without apical setae. Intermediate abdominal tergites with strong erect discal setae. ♂ without such coloration . . . . . **TRIGONOSPILA** Pokorný
- 3 2 + 2 *dc* setae (sometimes a very small additional *post dc* setula between the two main setae). Second supra-alar seta absent. Humeral callus with two setae. Wing with distance on vein *M* from the bend to *m-cu* as great as that between *m-cu* and *r-m*. Basal node of *R*<sub>4+5</sub> bare or with one minute hair. Two sternopleural setae. Abdomen with *Tr* + 2 not excavate to its hind margin . . . . . 4
- More than 2 + 2 *dc* setae (2 + 3 or 3 + 3 or 3 + 4, occasionally 2 + 4). Second supra-alar seta present. Humeral callus with three or more setae. Wing with distance on vein *M* from the bend to *m-cu* conspicuously less than that from *m-cu* to *r-m*. Basal node of *R*<sub>4+5</sub> with at least two hairs or setulae. Two or three sternopleural setae. Abdomen with *Tr* + 2 excavate to its hind margin (except in *Lixophaga* and *Lecanipa*) . . . . . 5
- 4 Propleuron bare. ♂ with one pair of strong erect discal setae on each abdominal tergite from *T*<sub>3</sub> to *T*<sub>5</sub>, ♀ without abdominal discal setae. ♂ without proclinate orbital setae. ♀ with ovipositor in form of a long strong downcurved hook easily seen in profile. ♀ hind coxa with apicoventral setae modified into short blunt black pegs . . . . . **MEDINODEXIA** Townsend
- Propleuron sparsely haired. Both sexes without abdominal discal setae. ♂ with two pairs of proclinate orbital setae (like the ♀). ♀ with very short broad flattened ovipositor that is not visible in profile. ♀ hind coxa with apicoventral setae not so modified . . . . . **MONOLEPTOPHAGA** Baranov
- 5 Propleuron bare. Vibrissae inserted about on a level with the epistomal margin. Parafacials bare (except in *Pareupogona*). Infrascapular hairs sometimes present . . . . . 6
- Propleuron haired. Vibrissae usually inserted at a level distinctly above the epistomal margin. Parafacials usually entirely haired or haired at upper ends, seldom entirely bare. Infrascapular hairs absent . . . . . 10
- 6 Fore tibia with two *pv* setae. Intermediate abdominal tergites with discal setae. Second costal sector bare ventrally. Hind tibia without a *pd* preapical seta. Humeral callus with the three main setae standing in a straight line (except in *Lecanipa*). ♂ without proclinate orbital setae . . . . . 7
- Fore tibia with one *pv* seta. Intermediate abdominal tergites without discal

- setae. Second costal sector haired ventrally. Hind tibia with a distinct *pd* preapical seta in addition to the normal *ad* and *d* preapicals. Humeral callus with three setae standing in a triangle. ♂ with two pairs of proclinate orbital setae (like the ♀) . . . . . **LIXOPHAGA** Townsend
- 7 Eyes bare. Parafacials finely and sparsely haired. Facial ridges finely setose on lower two-fifths or half. Mid tibia with two *ad* setae . . . . . **PAREUPOGONA** Townsend
- Eyes densely haired. Parafacials bare. Facial ridges with strong downcurved setae on most of their height. Mid tibia with one or two *ad* setae . . . . . 8
- 8 Mid tibia with one submedian *ad* seta. 3 + 4 *dc* setae. Abdominal T<sub>1</sub> + 2 excavate to its hind margin. Humeral callus with the three main setae standing in line. Infrascapular hairs absent . . . . . 9
- Mid tibia with two *ad* setae. 3 + 3 *dc* setae (supernumerary fourth *post dc* occasionally present between the normal first and second *post dc* setae). Abdominal T<sub>1</sub> + 2 with excavation clearly not reaching hind margin. Humeral callus with the three main setae standing in a triangle. Infrascapular hairs present . . . . . **LECANIPA** Rondani
- 9 Three sternopleural setae. Tergites of ♀ abdomen compressed to form a mid ventral abdominal keel bearing stubby spinules. ♀ with ovipositor in form of a strong downcurved hook-like piercer . . . . . **COMPSILURA** Bouché
- Two sternopleural setae. Tergites of ♀ abdomen normal. ♀ without externally visible piercing ovipositor . . . . . Undetermined genus [? gen. n.]
- 10 2 + 3 *dc* setae. Two sternopleural setae. Eyes bare. Parafacials fully haired. Intermediate abdominal tergites with discal setae . . . . . **DELTOMYZA** Malloch
- Dorsocentral setae 3 + 4 or 3 + 3 (rarely 2 + 4). Three sternopleural setae (except sometimes in *Zosteromeigenia*). Eyes bare or haired. Parafacials haired or bare, or partially haired. Intermediate abdominal tergites without discal setae (except in *Paropsivora*) . . . . . 11
- 11 Three *post dc* setae. Abdomen of ♂ with a fascicle of long dense hair on each side of T<sub>5</sub> (last visible tergite). Parafacials mainly or totally bare, if haired then hairing confined to area immediately below lowest frontal setae . . . . . 12
- Four *post dc* setae. Abdomen of ♂ without dense hair fascicles on T<sub>5</sub>. Parafacials completely haired or at least haired on uppermost quarter or third . . . . . 13
- 12 Fore tibia with two *pv* setae. Mid tibia with two *ad* setae. Intermediate abdominal tergites with discal setae. Humeral callus with four setae (basal row of three in which median one weakest, and a fourth seta set forwards of the basal row and *stronger* than middle seta of the basal row). Bend of vein *M* strongly abrupt. Eyes haired. Prothorax haired . . . . . **PAROPSIVORA** Malloch
- Fore tibia with one *pv* seta. Mid tibia with one *ad* seta. Intermediate abdominal tergites without discal setae. Humeral callus with only two strong setae, sometimes a rather weak third seta. Bend of vein *M* not strongly abrupt. Eyes bare [haired in an undescribed New Guinea species]. Prothorax bare [haired in undescribed New Guinea species] . . . . . **ZOSTEROMEIGENIA** Townsend
- 13 Facial ridges bare (except for the usual few setulae immediately above the vibrissae). Eyes bare or haired. ♀ with the usual well developed outer vertical setae. Vibrissae conspicuously above the level of the epistomal margin (except in *Zenargomyia*) . . . . . 14
- Facial ridges strongly setulose up most of their height. Eyes densely haired. ♀ without outer vertical setae [character in need of confirmation as very few *Pilimyia* females seen]. Vibrissae inserted only slightly above the level of the epistomal margin . . . . . **PILIMYIA** Malloch
- 14 Vibrissae inserted only very slightly above the level of the epistomal margin. Eyes bare. Parafacials bare except on the uppermost quarter or third (Text-fig. 49). Ocellar setae very strong. Apical scutellar setae rather strong and crossed . . . . . **ZENARGOMYIA** Crosskey

- Vibrissae inserted well above the level of the epistomal margin. Eyes bare or haired. Parafacials completely haired or haired at least on the upper halves. Ocellar setae usually absent or weak, sometimes moderately strong in ♀. Apical scutellar setae usually very weak and hair-like, sometimes absent, seldom well developed . . . . . 15
- 15 Facial regions of head with yellow or orange ground colour and bright yellow pollinosity. Eyes bare. Basicosta reddish yellow. Legs usually all or mainly reddish yellow, at least tarsi reddish yellow. Haired areas of parafacials not nearly contiguous with haired areas of genal dilations (therefore a conspicuous bare area between haired part of parafacial and the gena). On average larger forms, length 7-12 mm, often with yellow to golden orange hair on sides of thorax and sometimes also the abdomen . . . . . **FROGGATTIMYIA** Townsend
- Facial regions of head with rather indeterminate ground colour, not bright yellow and if pale usually rather reddish, pollinosity greyish white to very pale yellowish. Eyes bare or haired, often densely haired. Basicosta nearly always dark brownish or blackish brown. Legs brownish black, sometimes with reddish or reddish yellow tibiae, tarsi dark (except for reddish yellow fore tarsi in male of *A. scutellata*). Haired areas of parafacials nearly contiguous with haired areas of genal dilations (only a very narrow bare gap between parafacial and genal hairing). On average smaller forms, length 5-9 mm, without pale hair on thorax or abdomen . . . . . **ANAGONIA** Brauer & Bergenstamm
- [Note: no really tangible distinction has been found between *Froggattimyia* and *Anagonia*]

### Tribe EXORISTINI

The exoristines are moderately well represented in Australia and Tasmania, seven genera being known from the area. None is endemic, and several of them occur widely in the Oriental Region (*Eozenillia*, *Austrophorocera*) or in most of the zoogeographical regions (*Exorista*, *Stomatomyia*); *Hillomyia* (= *Hillia* Malloch, preocc.) is known from only a few specimens but is perhaps an essentially Papuan genus that has reached the Northern Territory of Australia.

The tribe is reasonably distinctive, possessing the combination of small pre-alar seta plus non-convergent subapical scutellar setae plus abruptly angulate bend to vein *M* (the bend normally accompanied by at least a trace of a fold in the position of *M*<sub>2</sub> continuing towards the wing margin, Text-fig. 87); the genera found in Australia have unusually dependable characters, and most are considerably easier to identify reliably than the genera in most other goniine tribes. Some features common to all the Australian exoristines may be usefully noted as follows: prosternum always haired; male always without proclinate orbital setae; mid tibia with a submedian *v* seta; mid tibia with two or more *ad* setae; hind tibia always without *pd* preapical seta; second costal sector bare ventrally; infrascapular hairs absent; parafacials never completely haired.

### KEY TO AUSTRALIAN GENERA OF EXORISTINI

- 1 2 + 3 *dc* setae. Wing with cell *R*<sub>5</sub> closed before the wing margin and with a distinct petiole. Distance on vein *M* from bend to *m-cu* as great as or greater than that from *m-cu* to *r-m*. Scutellum without definite preapical setae. Humeral callus with two setae. Eyes bare . . . . . 2

- 3 + 3 or 3 + 4 *dc* setae. Wing with cell  $R_5$  not closed before the wing margin, at least narrowly open. Distance on vein  $M$  from bend to *m-cu* much less than that from *m-cu* to *r-m* (except in one species of *Stomatomyia*). Scutellum with a pair of preapical setae. Humeral callus with three or four setae. Eyes bare or haired . . . . . 3
- 2 Abdomen with  $T_1 + 2$  excavate to its hind margin. Vein  $R_1$  setulose. Fore tibia with two *pv* setae. Propleuron bare. Scutellum with strong upwardly directed apical setae. Upper occiput without black setulae behind the postocular row. Abdomen with conspicuous white-pollinose bands on  $T_3$  to  $T_5$ . **CHAETORIA** Becker
- Abdomen with excavation of  $T_1 + 2$  not reaching the hind margin of the tergite. Vein  $R_1$  bare. Fore tibia with one *pv* seta. Propleuron with a few long white hairs [careful examination needed]. Apical scutellar setae almost absent, represented by a pair of fine hairs. Upper occiput with a few fine black setulae behind the postocular row. Abdomen uniformly black and rather shining

**HILLOMYIA** Crosskey

- 3 3 + 3 *dc* setae. Last section of vein  $Cu_1$  (from *m-cu* to wing margin) very long, more than half as long as the penultimate section and very much longer than *m-cu*; *m-cu* joining  $Cu_1$  at an oblique angle. Apical scutellar setae directed very strongly upwards. Costal spine well developed, usually very easily distinguishable from marginal costal setulae and as long as cross-vein *r-m* or longer . . . . . 4
- 3 + 4 *dc* setae (except in one unidentified sp. from Northern Territory). Last section of vein  $Cu_1$  normal, shorter than or subequal in length to *m-cu* and much less than half as long as the penultimate section; *m-cu* joining  $Cu_1$  approximately at a right-angle. Apical scutellar setae nearly horizontal or directed only slightly upwards (except in some *Exorista*). Costal spine not developed, indistinguishable from marginal costal setulae . . . . . 5
- 4 Abdomen without discal setae on intermediate tergites ( $T_3$  and  $T_4$ ). Palpi well developed. ♀ with upper pair of reclinate orbital setae showing at most only a slight outward twist towards the eyes. Apical scutellar setae weak, very much smaller than the lateral scutellar setae. ♂ with or without outer vertical setae, if present then obviously weaker than ocellar setae

**STOMATOMYIA** Brauer & Bergenstamm

- Abdomen with two or more very strong erect discal setae on each intermediate tergite, accompanied by numerous smaller stiff erect setulae. Palpi absent or almost so (at most represented by a minute papilla bearing a long apical hair) (well developed in an undescribed species). ♀ with the upper pair of reclinate orbital setae enormously strong and directed outwards over the eyes (simulating prevERTICAL setae). Apical scutellar setae extremely strong, almost as large as lateral scutellar setae. ♂ with very strong outer vertical setae subequal in size to ocellar setae . . . . . **SPOGGOSIA** Rondani\*
- 5 Facial ridges armed with strong downcurved setae on most of their height. Eyes densely haired. Robust forms with short inconspicuous  $M_2$  fold extending from bend of vein  $M$ ; hypopygium of ♂ never with golden hair . . . . . 6
- Facial ridges mainly bare, only with weak hairs and setulae immediately above the vibrissae which extend at most only for one-third of the height of the facial ridges. Eyes bare or haired. More slender forms with rather narrow tapering abdomen and with a long conspicuous  $M_2$  fold in the wing extending from the bend of  $M$ ; ♂ often with dense golden hair on the hypopygium (visible in situ)

**EXORISTA** Meigen

- 6 3 + 4 *dc* setae. Ocellar setae absent or very weak and wiry. Frons and thoracic dorsum not golden . . . . . 7
- 3 + 3 *dc* setae (? aberrant). Ocellar setae very strong (much larger than upper pair of reclinate orbital setae). Frons and thoracic dorsum conspicuously golden to naked eye . . . . . Undetermined genus & species

\* See Appendix, p. 209.

[Two specimens (♂ and ♀) are in BMNH, London, collection that run out here. They are from Northern Territory. Superficially they much resemble the genus *Phorinia* Robineau-Desvoidy and should perhaps be assigned to it. The presence of only three *post dc* setae may be an aberration, as four would be expected from the total facies.]

- 7 Interfrontal area at mid point subequal in width to parafrontal or at least two-thirds as wide. Second arisal segment not more than twice as long as wide

**AUSTROPHOROCERA** Townsend

- Interfrontal area at mid point not more than half as wide as parafrontal in most specimens, occasionally up to two-thirds as wide. Second arisal segment about 2.5–4 times as long as wide . . . . .

**EOZENILLIA** Townsend

[This is the least satisfactorily distinguishable genus in the Australian exoristine fauna. The one included species, *E. remota*, is undoubtedly congeneric with *Eozenillia* type-species and is therefore assigned to *Eozenillia*. Distinctions between *Eozenillia* and *Austrophorocera* are very intangible, and probably the former should be synonymised with the latter.]

### Tribe ETHILLINI

This small group was originally defined by Mesnil (1944) to include an aggregate of forms possessing a facies much like that of the Winthemiini or Sturmiini but differing from these in having a small pre-alar seta and by having the outer edge of the lower calypter conspicuously bent downwards. These characteristics undoubtedly help to define what appears to be a natural group, although some species of undoubted sturmiines and carceliines have a similar 'downbent' calypter. Conversely some forms such as *Mycteromyiella* in which the lower calypter is not markedly bent down on its outer margin seem to belong in the Ethillini. The undescribed New Guinea fauna contains several interesting forms which to a large extent bridge the gap between *Phorocerosoma* (placed by Mesnil in the ethillines) and *Mycteromyiella* (placed by Mesnil in the sturmiines) and it seems most appropriate – on present knowledge at least – to assign *Mycteromyiella* to the Ethillini.

The known hosts of *Phorocerosoma* are acridid grasshoppers and the known hosts of *Mycteromyiella* are species of Mantodea, but host records have not yet been obtained in Australia itself. The tribal distribution includes Tasmania as well as continental Australia. It is important to note that the characters given in the following key for *Phorocerosoma* apply to the single species known to occur in Australia, but do not necessarily fit extra-limital species of the genus. The generic identities of most of the New Guinea ethillines are too uncertain at present for these forms to be covered in the key.

#### KEY TO AUSTRALIAN GENERA OF ETHILLINI

- 1 Inner vertical setae converging and crossing before their apices. Abdominal  $T_1 + 2$  and  $T_3$  each with two pairs of very long strong erect median marginal setae. Abdomen without discal setae on intermediate tergites. Humeral callus with the three main setae standing in a triangle. ♀ with a pair of strong prevertical setae that curve outwards over the eyes and *without* outer vertical setae. Pre-alar seta longer than first *post ia* seta . **PHOROCEROSOMA** Townsend

- Inner vertical setae subparallel. Abdominal T<sub>1</sub> + 2 and T<sub>3</sub> each with one pair of median marginal setae (those of T<sub>1</sub> + 2 sometimes hair-like or virtually absent). Abdomen usually with one or two distinct discal setae on one or both intermediate tergites. Humeral callus with three main setae standing either in a straight line or in a triangle. ♀ without outwardly directed prevertical setae and with the usual pair of outer vertical setae. Pre-alar seta very small, shorter than first *post ia* seta . . . . . 2
- 2 Humeral callus with the three main setae standing in a straight line. Lower calypter with the outer edge distinctly bent downwards. Arista with second segment elongate, about 4-5 times as long as broad. Head with two pairs of strong reclinate orbital setae. Mid tibia with one *ad* seta. Vibrissae level with epistomal margin . . . . . **ETHILLA** Robineau-Desvoidy
- Humeral callus with the three main setae standing in a distinct triangle. Lower calypter not noticeably bent downwards. Arista with second segment not elongate, only about as long as broad. Head without definite reclinate orbital setae (at least in ♂, probably one pair in ♀). Mid tibia with two *ad* setae. Vibrissae inserted well above level of epistomal margin

**MYCTEROMYIELLA** Mesnil

### Tribe WINTHEMIINI

This group is very closely allied to the Carceliini and the Sturmiini and its recognition as a tribe is only doubtfully justified. Townsend (1941) placed *Winthemia* and its allies in the Sturmiini, but recent workers universally treat the winthemiines as a valid tribe and this course is followed for the present work. The arrangement of the humeral setae in *Winthemia* is rather distinctive, there being (in males at least) five setae in which three are strong and are spaced in a subtriangular arrangement; in this respect *Winthemia* differs from the Sturmiini in the strict sense in which the humerals are four arranged as three in a straight line and one set forwards. Mesnil (1944) used the presence of five humeral setae as a key character for recognition of the winthemiines, but in reality the character is poor - often in other winthemiine genera than *Winthemia* itself (e.g. in *Nemorilla*) five setae may not be definitely developed in males and are typically not developed in females (which usually have four humerals).

The winthemiines are best recognized among the Australian Goniinae by the following features in combination (though some Sturmiini and some Carceliini may show some of the features together): eyes densely haired; males without definite reclinate orbital setae; hind tibia (especially in males) with a well developed close-set *ad* fringe; barett completely haired (or nearly so); scutellum with strong crossed horizontal apical setae and with subapical setae inserted widely apart (their bases as distant from each other as base of either from the basal seta of the same side, or even more distantly separated than this) (as in *Carcelia*, Text-fig. 72). A noteworthy feature of several forms is the presence of pale yellow hair on the prosternum instead of the usual black hairs or setulae.

There is close superficial resemblance between Winthemiini and Ethillini, and as the genus *Mycteromyiella* (Ethillini) could easily be confused with the winthemiines it is included in the following key.

Mesnil (1949a : 80) treated *Crypsina* as a subgenus of *Winthemia* but it is here preferred to revert to its original generic status. This course maintains *Winthemia* as a more homogeneous genus, though - certainly - *Crypsina* is very closely allied.

## KEY TO AUSTRALIAN GENERA OF WINTHEMIINI

- 1 Parafacials haired on their whole extent . . . . . 2
- Parafacials bare . . . . . 3
- 2 Mid tibia with 2 or 3 strong *ad* setae. Vibrissae set high above epistomal margin (distance between level of their insertions and the margin of the epistome at least as great as width of antenna). Vibrissal insertions unusually close to each other, distance between vibrissae less than or not noticeably greater than distance between a vibrissa and the eye. Antennae bright orange  
**CRYPsINA** Brauer & Bergenstamm
- Mid tibia with one submedian *ad* seta. Vibrissae not or only a little above level of epistomal margin. Vibrissal insertions normal, distance between them much greater than distance between vibrissal base and the eye. Antennae largely blackish brown, or if extensively reddish orange then normally suffused with brown at least along forward edges of third segment  
**WINTHEMIA** Robineau-Desvoidy
- 3 Three sternopleural setae (2 + 1). Scutellum without lateral setae. Vibrissae inserted far above epistomal margin (by a distance greater than width of third antennal segment). Pre-alar seta weak, shorter than first *post ia* seta  
**[MYCTEROMYIELLA** Mesnil, tribe Ethillini]
- Two sternopleural setae (1 + 1). Scutellum with lateral setae. Vibrissae level with or only slightly above epistomal margin. Pre-alar seta strong, longer than first *post ia* seta . . . . . **NEMORILLA** Rondani

## Tribe CARCELIINI

As it is understood at present this tribe contains those Goniinae that have a large pre-alar seta and the genal region exceedingly narrow (the eyes being relatively so large that they occupy most of the side of the head with consequent reduction of the gena to a narrow strip below the eye that is narrower than the profrons) (Text-fig. 48). The Anacamptomyiini are similar in head facies, but are treated as distinct because of their unusual hosts (see under treatment of Anacamptomyiini below). Some forms closely resemble the Winthemiini because of their densely haired eyes and arrangement of scutellar setae; the genus *Carcelimyia* is especially like the winthemiines because the barettæ is completely haired.

On present evidence the tribe appears to be rather poorly represented in Australia, in contrast to its rich development in the Oriental Region. It is probable, though, that other carceliine genera than those already known will be found eventually in Queensland; this is especially likely because several genera (e.g. *Thecocarcelia*) are known from New Guinea, and there seems to be no reason why they should not occur also in northern Queensland. The distribution includes Tasmania, from which one species is known (*Carcelia tasmanica* Robineau-Desvoidy).

## KEY TO AUSTRALIAN GENERA OF CARCELIINI

- 1 Four sternopleural setae. Eyes bare. Antennae exceptionally long, nearly reaching epistome. ♀ with flat shining sclerotized ovipositor (visible externally)  
**THECOCARCELIA** Townsend
- Two sternopleural setae. Eyes bare or haired. Antennae not exceptionally heavy, normally not reaching as far as the epistome. ♀ without such ovipositor . . . . . 2

- 2 Eyes bare. Apical scutellar setae very small, directed upwards and either not meeting or crossing at tips. Subapical scutellar setae not conspicuously distant from each other, their bases separated by a distance not greater than that between a subapical seta and its corresponding basal seta. Upper occiput with some fine black setulae behind postocular row

**ARGYROPHYLAX** Brauer & Bergenstamm

- Eyes haired. Apical scutellar setae strong, crossed and horizontal. Subapical scutellar setae very widely separated, distance between bases much greater than that between base of a subapical seta and its corresponding basal seta (Text-fig. 72). Upper occiput without black setulae behind postocular row . . . . . 3
- 3 Dorsocentral setae 3 + 4. Scutellum with extremely strong apical setae that are at least as strong as, and usually larger than, the lateral setae. Hairing of eyes long and dense, very conspicuous. Barete normally with hairing, at least at anterior end. Wings hyaline. Not conspicuously black forms . . . . . 4
- Dorsocentral setae 3 + 3 (four *post dc* setae in occasional specimens). Scutellum with apical setae normally shorter and weaker than lateral setae. Hairing of eyes rather short and usually rather sparse, not so immediately conspicuous. Barete totally bare. Wings suffused with brown anterobasally. Conspicuously black forms with shining abdomen which shows bright silver pollinose areas on each side of T<sub>3</sub>-T<sub>5</sub> (these especially noticeable on T<sub>4</sub>, at least in ♀)

**ARGYROTHELAIRA** Townsend

- 4 Facial ridges bare. Barete when haired with hairing confined to anterior half (except sometimes in specimens of *Carcelia* s. str.) . **CARCELIA** Robineau-Desvoidy
- Facial ridges closely setulose up most of their height (Text-fig. 48). Barete completely haired . . . . . **CARCELIMYIA** Mesnil

KEY TO AUSTRALIAN SUBGENERA OF *CARCELIA*

- 1 Mid tibia with a submedian *v* seta. Ocellar setae absent or very small, fine and wiry. ♂ with one pair of reclinate orbital setae, ♀ usually with two pairs (specimens with two such setae on one side and one on the other occur). Hind coxa bare or setulose posterodorsally . . . . . subgenus **CARCELIA** Robineau-Desvoidy
- Mid tibia without a *v* seta. Ocellar setae very strong (except in *murina* where absent or hair-like). Both sexes with two pairs of reclinate orbital setae. Hind coxa entirely bare posterodorsally. . . . . subgenus **SENOTETOPIA** Macquart

Tribe **ANACAMPTOMYIINI**

Townsend (1940) recognized a tribe for *Anacamptomyia* and its allies and placed it near *Compilurini* (i.e. *Blondeliini*), but Mesnil (1944) included the anacamptomyiines among the carceliines. On adult morphology Mesnil's placement seems to be more appropriate than Townsend's, and in fact it is difficult to find characters that satisfactorily differentiate the *Anacamptomyiini* from the *Carceliini*. Nevertheless the *Anacamptomyiini* is here treated as a valid tribe because of its biology: the members of the tribe are unique amongst the *Goniinae* in being parasites of paper-making wasps (such as *Belonogaster* and *Polistes*), and this host-relationship is so exceptional that it appears justified to give it considerable weight in assessing whether or not to treat the flies involved as carceliines or not. It appears possible that the resemblances between *Carceliini* and *Anacamptomyiini* are mainly convergent.

Mesnil (1944 : 27) synonymized Malloch's Australian genus *Vespivora* with the African genus *Anacamptomyia* Bischof. This synonymy is accepted here, but it is pointed out that the only Australian species, viz. *nigriventris* (the type-species of *Vespivora*) differs in several respects from typical *Anacamptomyia*; for example the eyes are bare, there are no discal setae on the intermediate abdominal segments, the median marginal setae of  $T_{1+2}$  are weak or absent and there are only two  $p$  setae on the mid tibia. On the other hand, the general facies of *Vespivora*, the setulose facial ridges and the upwardly directed and crossed apical scutellar setae, and the tendency towards reclinate uppermost frontal setae, conform with *Anacamptomyia* (though the apical scutellars are much weaker than the enormous apicals in the African *Anacamptomyia* species).

The genus *Koralliomyia* is tentatively placed in this tribe because of the Hymenopterous hosts and the anacamptomyiine-facies (head profile as Text-fig. 52).

The species in this tribe are rather unusual amongst goniines for the pallid reddish or reddish yellow colouring of most specimens. In all the Australian species the basicosta is clear pale yellow-orange and the legs (including the tarsi) are usually all reddish yellow (sometimes the femora partially dark brown in *nigriventris*). So far the Australian distribution is only known to include Queensland and New South Wales. One genus, *Euvespivora* Baranov, has very recently been discovered in Hawaii (Oahu).

Biologically the Anacamptomyiini are an Old World counterpart to the small tribe Ophirionini of the Neotropical region, members of which also parasitize social Vespidae (especially the genus *Polybia* Lepeletier).

#### KEY TO AUSTRALIAN GENERA OF ANACAMPTOMYIINI

- 1 Propleural seta present. Parafrontals meeting in mid-line of frons, interfrontal area therefore obliterated or almost so. Antennae very small, antennal axis below mid-eye level. Mid tibia with at least two strong *ad* setae. [Parasite of *Ropalidia* and *Polistes*] . . . . . **KORALLIOMYIA** Mesnil
- Propleural seta absent. Parafrontals not meeting, interfrontal area well developed. Antennae not unusually small, antennal axis distinctly above mid-eye level. Mid tibia with only one strong *ad* seta. [Parasites of *Polistes*] . . . . . 2
- 2 Facial ridges strongly setulose for most of their height . . . **ANACAMPTOMYIA** Bischof
- Facial ridges bare (except for usual small setulae immediately above vibrissae) . . . **EUVESPIVORA** Baranov

#### Tribe STURMIINI

The Sturmiini are very well represented in Australia and Tasmania, the fauna including many genera that are widely distributed elsewhere in the Old World as well as several distinctive endemic genera. Several undescribed species are known, and some of these may require additional new genera for their satisfactory placement.

The group is moderately distinctive among the goniines with large pre-alar seta, and most forms possess the following features in combination. Vibrissae inserted at least slightly above (usually well above) the epistomal margin; gena wider than the profrons;  $3 + 4$  *dc*

setae; humeral setae arranged as three in a straight line with one in addition set forwards of the main line (this fourth seta occasionally missing); lower calypter with well defined inner posterior angle and inner margin closely following edge of the scutellum. Other tribes possess some of these characteristics, or some members of them do, but usually not all simultaneously (for example, *Winthemia* and *Carcelia* have a sturmiine type of lower calypter in which the inner edge abuts closely to the scutellum). All Australian Sturmiini, in addition to the characters mentioned, have a strong submedian *v* seta on the mid tibia and have the ventral surface of the second costal sector bare.

The endemic forms include a well-developed group in which the parafacials are strongly haired, the eyes densely haired, the ocellar setae absent, the lateral scutellar setae absent (exceptions in *Polychaeta*), and in which there is only one definite pair of reclinate orbital setae. In some of these forms the antennae are exceptionally long and the second arisal segment elongate, but such forms are interconnected by intermediates with other forms in which the antennae are not specially elongate and both basal arisal segments short. At present several genera (e.g. *Tritaxys*, *Eurygastropsis*, *Polychaeta*) are recognized in this complex, but future study may well suggest that some of these genera ought to be amalgamated. *Eurygastropsis*, for instance, is hardly distinguishable from *Tritaxys* (syn. *Goniophana*) by more than the abdominal pollinosity and colour. The genus *Polychaeta* exhibits some baffling variability in the scutellar setae; normally in sturmiines these are extremely stable in strength and complement, but in *Polychaeta* what appears to be the same species may have no lateral scutellar setae at all, or may have one or two pairs extremely strongly developed (or even be bilaterally asymmetrical in bristle complement in the same specimen).

The non-endemic forms found in Australia include well known genera of the palaeotropics such as *Palexorista*, *Sisyropa*, *Sturmia* and *Zygobothria*. Genera such as these occur (as would be expected) mainly in Queensland, though some are represented widely throughout Australia; as a rule the non-endemic sturmiine genera are unrepresented in Tasmania, though *Blepharipa* at least occurs there. The widespread genera *Drino* and *Pales* are found in New Guinea, and their eventual discovery in Queensland seems a possibility; they have accordingly been entered in the key that follows.

The genus *Winthellia* (described by Mesnil under the preoccupied name *Thyellina*) is here placed in the Sturmiini, although described as a winthemiiine. Its characters appear to ally it closely with *Tasmaniomyia*, which has all the main diagnostic features of Sturmiini.

#### KEY TO AUSTRALIAN GENERA OF STURMIINI

- |   |  |                       |
|---|--|-----------------------|
| 1 | Wing cell $R_5$ normal, distinctly open at the wing margin . . . . .   | 2                     |
| - | Wing cell $R_5$ closed just at or before the wing margin . . . . .   | 24                    |
| 2 | Wings distinctly bicolorous, creamy yellowish near base and suffused with brown anteromedially. Interfrontal area very reduced, under half as wide at mid point as parafrontal. Apical scutellar setae exceptionally strong and horizontal, as large as or larger than the subapical scutellar setae . . . . . | <b>PALIANA</b> Curran |
| - | Wing not so, hyaline or at most only faintly yellowish or brownish anterobasally. Interfrontal area not exceptionally narrow, subequal in width to parafrontal or at least half as wide. Apical scutellar setae usually weak or very weak (some-   |                       |

- times absent) and directed at least slightly upwards, if strong and horizontal then weaker than subapical scutellar setae . . . . . 3
- 3 Eyes haired (hairing long, dense and very conspicuous) . . . . . 4
- Eyes bare (a few very minute hairs sometimes visible under high magnification) . . . . . 13
- 4 Head without definite reclinate orbital setae. Frontal region bulbously convex and with very reduced frontal setae (fig. 21 in Malloch, 1929*b*). Head ground colour bright orange-yellow with blackish ocellar triangle. Legs unicolorous orange-yellow. Abdomen thickly greyish white pollinose with a pattern of black spots. Each side of venter of abdominal tergites 3 and 4 in ♂ with a dense hair fascicle . . . . . **ARRHENOMYZA** Malloch
- Head with one or more pairs of strong reclinate orbital setae. Frontal region not bulbously convex (distinctly flattened when seen in profile) and with well developed frontal setae. Head ground colour not so. Legs black or brownish black (except in *Zebromyia*). Abdomen without such pattern. ♂ without dense hair fascicles on abdominal venter . . . . . 5
- 5 Facial ridges very wide and covered with several irregular rows of small strong setulae (setulae only slightly increasing in size towards front edge of ridge). Parafacials haired at upper ends immediately below lowest frontal setae. Prescutum and scutum each with a transverse row of four small black spots anteriorly (distinct against the yellowish grey pollinose background). Abdomen conspicuously patterned, T<sub>3</sub>–T<sub>5</sub> greyish yellow pollinose with dark marks in form of a pair of wide blackish or dark reddish brown triangles on T<sub>3</sub> and T<sub>4</sub> and a pair of small round black spots at tip of T<sub>5</sub>. Head with reddish ground colour and chequered silvery white pollinosity that appears to shift with direction of light. Legs reddish yellow . . . . . **ZEBROMYIA** Malloch
- Facial ridges bare or setose; if setose then with a row of strong setae on front edge and only one or two inconspicuous setulae outside of the main row. Parafacials either completely haired or completely bare. Prescutum and scutum without such pattern. Abdomen without such pattern. Head not so. Legs black or brownish black . . . . . 6
- 6 Parafacials completely haired. Ocellar setae absent. Always fewer than four sternopleural setae. Lateral scutellar setae absent (except in occasional specimens of *Polychaeta*) . . . . . 7
- Parafacials bare. Ocellar setae present or absent. Sometimes four *stpl* setae. Lateral scutellar setae present . . . . . 9
- 7 Dorsum of abdomen shining black or very dark red-brown except for last visible tergite (T<sub>5</sub>) which is thickly coated with uniform whitish pollinosity (pale last abdominal segment therefore strikingly contrasting with the rest of the abdomen) . . . . . **EURYGASTROPSIS** Townsend
- Abdomen not so, ground colour reddish to blackish with thin whitish pollinosity (sometimes appearing patchily distributed) on all tergites, no segments shining and last segment not contrasted in colour with remainder of abdomen. . . . . 8
- 8 Arista thickened on more than its basal half, sometimes on most of its length; second aristal segment normally at least 2.5 times as long as broad. Pollinosity of abdomen tending, to naked eye, to appear more conspicuous anteriorly on segments than elsewhere or to appear rather chequered. Smaller forms, length 8–11 mm . . . . . **TRITAXYS** Macquart
- Arista only thickened on its basal half or less; second aristal segment not more than twice as long as broad. Pollinosity of abdomen tending, to naked eye, to appear as a very thin but evenly distributed bloom. Larger forms, length 12–16 mm . . . . . **POLYCHAETA** Macquart
- [This genus is only very doubtfully distinct from *Tritaxys*]
- 9 Four sternopleural setae (2 + 2). Second aristal segment distinctly elongate (about three times as long as broad or more) . . . . . 10

- Two or three sternopleural setae (1 + 1 or 2 + 1). Second arisal segment not at all elongate . . . . . 11
- 10 One pair of reclinate orbital setae. Ocellar setae absent. Mid tibia with at least two *ad* setae . . . **SISYROPA** Brauer & Bergenstamm [part: *S. taylora* Curran]
- Two or three pairs of reclinate orbital setae. Ocellar setae present, strong. Mid tibia with one *ad* seta . . . . . **PARADRINO** Mesnil
- 11 Facial ridges strongly setose up most of their height. One pair of reclinate orbital setae. Dorsum of thorax shining bluish black, without pattern . . . . . 12
- Facial ridges bare. Two pairs of reclinate orbital setae. Dorsum of thorax yellowish grey to golden pollinose with a bold pattern of four black vittae on prescutum, and a large black anteromedian area and pair of black sublateral vittae on the scutum . . . . . **CALOZENILLIA** Townsend
- 12 Ocellar setae absent. One strong isolated *ad* seta on mid tibia . . . **PALIA** Curran
- Ocellar setae present. Two or more strong *ad* setae on mid tibia . . . **PALES** Robineau-Desvoidy
- 13 Parafacials completely covered with long strong hair (hairing *very* conspicuous). Ocellar setae directed outwards and not at all forwards. Lateral scutellar setae absent. Parafrontals covered with long strong inclinate setulae that are nearly as strong as the frontal setae. ♂ with very strong external vertical setae . . . **PARAGONIA** Mesnil
- Parafacials bare or with rather weak inconspicuous hairing confined to upper halves. Ocellar setae proclinate or absent (slightly divaricate in *Winthellia*). Lateral scutellar setae present or absent. Parafrontals usually without such strong setae outside the frontal setae. ♂ usually without definite external vertical setae . . . . . 14
- 14 Lateral scutellar setae absent (scutellum therefore with only three pairs of marginal setae, the basals, subapicals and apicals). Upper halves of parafacials at least partially haired. Three sternopleural setae. ♂ abdomen without secondary sexual modified hair . . . . . 15
- Lateral scutellar setae present (scutellum with a total of four or five pairs of marginal setae). Upper halves of parafacials with or without hairing. Three or four sternopleural setae. ♂ abdomen usually with some or most of the hair of the venter of T<sub>4</sub> (sometimes also T<sub>3</sub>) modified . . . . . 17
- 15 Ocellar setae present. Facial ridges bare (except for the usual few setulae on lowermost quarter immediately above vibrissae). Abdominal tergites 1 + 2 and 3 each with a pair of strong median marginal setae. One or both of intermediate abdominal tergites with discal setae. Upper occiput with irregular black setulae behind the postocular row . . . . . 16
- Ocellar setae absent. Facial ridges strongly setulose for more than half their height. Abdominal tergites 1 + 2 and 3 without median marginal setae. Intermediate abdominal tergites without discal setae. Upper occiput without black setulae behind the postocular row . . . **ANAMASTAX** Brauer & Bergenstamm
- 16 Mesonotum shining bluish black. Abdomen shining blackish green with traces of reddish ground colour (not noticeably pollinose) . . . **TASMANIOMYIA** Townsend
- Mesonotum greyish white pollinose with four narrow blackish vittae. Abdomen blackish with chequered whitish pollinosity conspicuous on intermediate tergites . . . **WINTHELLIA** Crosskey
- [This genus and *Tasmaniomyia* are not separable on any convincing characters and may need to be synonymized when better known]
- 17 Prosternum bare. Facial ridges with strong downcurved setae on more than half their height . . . . . **BLEPHARELLA** Macquart
- Prosternum haired or setulose. Facial ridges bare (except for usual very small setulae immediately above vibrissae) . . . . . 18
- 18 Head with two pairs of reclinate orbital setae (upper one sometimes weak) . . . 19

- Head with one pair of reclinate orbital setae (strong and isolated, but ♀ sometimes with a smaller erect seta ventrad and mesad of the true reclinate orbital) . . . . . 22
- 19 Gena conspicuously broad, two-fifths or more of eye height. Facial ridges prominent at least lower half well visible in profile. Parafacials about three times as wide as third antennal segment. Three sternopleural setae (exceptionally four but if so not arranged 2 + 2). Basal node of vein  $R_{4+5}$  with four or more small setulae. Mid tibia with at least two strong *ad* setae. Head thickly golden pollinose. Dorsum of thorax bright yellow or golden pollinose with four bold black vittae (inner pair shorter than outer pair) . . . . . **UGIMEIGENIA** Townsend
- Gena narrow, not exceeding one-sixth of eye height. Facial ridges not visible in profile or only just visible immediately above vibrissae. Parafacials less than twice as wide as third antennal segment. Four sternopleural setae (2 + 2). Basal node of vein  $R_{4+5}$  with one setula (rarely also with one minute supernumerary hair). Mid tibia with one *ad* seta (except in *Zygobothria atropivora*). Head not thickly golden pollinose, at most only partially pale yellow. Dorsum of thorax not so . . . . . 20
- 20 Ocellar setae very strong, subequal in size to reclinate orbital setae, inserted slightly in front of anterior ocellus. Parafacials totally bare. Mid tibia with one or two *ad* setae . . . . . **ZYGOBOTHRIA** Mik
- Ocellar setae absent or very weak and much smaller than reclinate orbital setae, when present not inserted at all forwards of the anterior ocellus. Parafacials finely haired on upper parts (bare in *Drino* which is not yet positively known from Australia). Mid tibia with one *ad* seta . . . . . 21
- 21 Parafacials finely haired on upper parts (Text-fig. 51), hair sometimes extending slightly on to lower halves, occasionally only a few hairs immediately below lowest frontal setae but parafacials never entirely bare. Ocellar setae present, weak and wiry. Each side of venter of fourth abdominal tergite of ♂ with well defined hair-patch, usually large and dense with hair very long and converging into a distinct fascicle . . . . . **PALEXORISTA** Townsend
- Parafacials completely bare. Ocellar setae absent. Each side of venter of fourth abdominal tergite of ♂ with unmodified hair or with a large area of short fine close-set hair not formed into a definite fascicle . . . . . **DRINO** Robineau-Desvoidy
- 22 Scutellum with subapical setae inserted very far apart, distance between their bases conspicuously greater than that between a subapical seta and its corresponding basal seta. Apical scutellar setae very strong, horizontal or almost so, nearly as strong as lateral setae. Four sternopleural setae (2 + 2). Abdomen of ♂ with a large area of very long dense hair around the sides of  $T_4$  . . . . . **STURMIA** Robineau-Desvoidy
- Scutellum with subapical setae not very widely separated, distance between their bases less than or at most subequal to that between a subapical seta and its corresponding basal seta. Apical scutellar setae very weak and directed at least slightly upwards, very much weaker than lateral setae. Three or four sternopleural setae. Abdomen of ♂ with or without such hair . . . . . 23
- 23 Abdomen with last tergite conspicuously small in relation to preceding tergite ( $T_5$  usually not more than about half as long as  $T_4$ ). Three or four sternopleural setae (normally three in ♂ and four in ♀, but males with four and females with three occur). Lateral scutellar setae very strong, subequal in size to basals and subapicals (often a second pair of laterals developed in addition to main pair). Abdomen of ♂ with large area of very dense long hair around sides of  $T_4$ .  $T_1 + 2$  and  $T_3$  always without median marginal setae. Larger forms (length 9-15 mm) . . . . . **BLEPHARIPA** Rondani
- Abdomen with last tergite not unusually small in relation to preceding tergite ( $T_5$  subequal in length to  $T_4$  in ♂, about two-thirds as long in ♀). Four sternopleural setae in both sexes. Lateral scutellar setae well developed but distinctly

weaker than basals or subapicals (never a second pair of laterals). Abdomen of ♂ with hair on T<sub>4</sub> unmodified. T<sub>1</sub> + 2 and T<sub>3</sub> with or without median marginal setae. Smaller forms (length 6–8 mm)

**SISYROPA** Brauer & Bergenstamm [part: undetermined spp.]

- 24 Eyes bare. Abdomen patterned, T<sub>3</sub>–T<sub>5</sub> thickly coated with whitish pollinosity except for a shining black transverse fascia on each intermediate tergite which is narrowly broken in the mid line but on each side extends round on to the ventral surface of the tergite. Legs orange-yellow with blackish brown tarsi

**QUADRA** Malloch

- Eyes haired. Abdomen without such pattern, appearing generally blackish or reddish black with an inconspicuous coating of yellowish grey pollinosity. Legs mainly black or brownish black, only tibiae reddish yellow

*'Quadra' dissimilis* Malloch (? gen. n.)

### Tribe GONIINI

This small tribe is easily distinguishable from all other members of the subfamily Goniinae occurring in Australia by the strong reclinate ocellar setae (in other goniine tribes the ocellars are either proclinate or absent). It is represented in eastern and western Australia but appears to be absent from Tasmania. Two genera are known from Australia, both of which have an extensive distribution in Africa and the Oriental Region; one of them (*Pseudogonia*) occurs also in the southern Palearctic and eastwards as far as New Guinea and the Solomons.

#### KEY TO AUSTRALIAN GENERA OF GONIINI

- 1 Three sternopleural setae (2 + 1, one of anterior pair sometimes almost hair-like). Scutellum without lateral setae (therefore with only two pairs of strong horizontal marginal setae). Parafacials bare. Facial ridges setulose on most of their height  
**GONIOPHTHALMUS** Villeneuve
- Four sternopleural setae. Scutellum with a pair of extremely strong lateral setae (therefore with three pairs of horizontal marginals). Parafacials strongly but sparsely haired (hairing nearest facial ridges setiform). Facial ridges bare  
**PSEUDOGONIA** Brauer & Bergenstamm

### Tribe ERYCIINI

This tribe is little more than a useful aggregate of genera to recognize temporarily, until more is known of the biology of the included forms (especially their reproductive habit). Almost certainly the tribe is polyphyletic and will later need to be dismembered and its constituent genera reassigned to freshly defined tribes. At the moment the tribe contains those genera of Goniinae with large pre-alar seta that will not satisfactorily fit into other tribes (at least, not without widening the definitions of these and destroying the homogeneity they have at present). In practice if a goniine with large pre-alar setae does not show the recognizable facies of a winthemiine, carceliine or sturmiine then it almost certainly belongs in this tribe and its genus is most likely to be recognizable from the eryciine generic key.

The key to Australian genera here given is, however, only a preliminary one. The Australian fauna contains many undescribed forms that will have to be fitted into the Eryciini when they are named. Eryciine forms are rather well developed in Australia, and most of the genera are endemic; some essentially extra-limital genera (such as *Aplomya* and *Erythrocerca*) occur, and it is likely that other Oriento-Papuan genera (such as *Aneogmena*) will eventually be found in Queensland. Some of the Australian eryciines, like *Austronilea*, are extraordinarily similar to Palaearctic counterparts, and the Tasmanian fauna includes several undescribed forms that belong in the subgroup Baumhaueriina (a segregate occurring elsewhere in the Palaearctic Region and southern Africa); the Tasmanian forms referred to are recognized by the possession in the females of a pair of outwardly-directed prevertical setae, and are the only Australian Goniinae known that possess prevertical setae (except for the species of *Spoggosia*).

It may be useful to note that all the Australian eryciines so far known have the lower surface of the second costal sector bare, and all have at least three setae on the humeral callus, these standing more or less in a straight line (there are no Australian eryciines, so far known at least, that have three humeral setae set in a well defined triangle: three humerals in a triangle occur in Walker's type of *Tachina calliphon*, which is an eryciine, but there is uncertainty as to whether this specimen is genuinely Australian).

The genus *Bactromyiella* is very difficult to place satisfactorily but is here retained in the Eryciini; the small *pra* seta suggests that it ought possibly to be placed in the Blondeliini, and the general facies and haired barette suggest that it would not be inappropriate to treat it as a winthemiine.

The eryciine genera *Aneogmena* and *Dolichocolon* are included in the following key as they occur in New Guinea, and may possibly occur in Australia.

#### KEY TO AUSTRALIAN GENERA OF ERYCIINI

- 1 Wing with cell  $R_5$  closed well before the wing margin and long-petiolate. Last section of vein  $Cu_1$  conspicuously longer than cross-vein  $m-cu$ . Two presutural dorsocentral (*prst dc*) setae (very weak third setula sometimes developed between two main setae). Apical scutellar setae directed almost straight upwards

**PHOROCEROSTOMA** Malloch

- Wing with cell  $R_5$  open at wing margin or just closed at the margin (not at all petiolate). Last section of vein  $Cu_1$  shorter than, or subequal in length to,  $m-cu$ . Three presutural dorsocentral setae (except in *Aneogmena* and *Erythrocerca* in which normally two). Apical setae of scutellum horizontal or directed obliquely upwards, sometimes absent . . . . . 2

- 2 Mid tibia without a submedian *v* seta. Barette haired along its length (sparsely in ♀). Sexes strongly dimorphic in colour and pattern: ♂ with thorax and first abdominal segment black and remainder of abdomen bright golden orange or orange-red; ♀ black with pleural regions, two fasciae on mesonotum, apex of scutellum, and transverse band on each abdominal tergite 3-5, greyish yellow to bright golden . . . . .

**BACTROMYIELLA** Mesnil

- Mid tibia with a submedian *v* seta. Barette bare or with only one or very few hairs anteriorly (more extensively haired in *Teretrophora*). Sexes not strongly dimorphic in colour or pattern, never as described above . . . . . 3

- 3 Mesonotum and abdomen with a bold pattern of small black spots against a very pale greyish yellow pollinose background, pattern comprised as follows: prescutum with pair of rounded sublateral spots and anteromedian black mark, scutum with prescutellar black spot; abdomen with  $Tr + 2$  black and a median and a pair of sublateral black spots on  $T_3$  and  $T_4$ . Legs uniformly reddish yellow. Presutural intra-alar seta absent, two or three postsutural intra-alar setae, *ia* setae therefore 0 + 2-3. Head profile as Text-fig. 50. **METAPHRYNO** Crosskey
- Nondescript forms without such pattern. Legs black or partly so, if mainly reddish yellow then at least the tarsi black-brown. Intra-alar setae always 1 + 3. Head profile different . . . . . 4
- 4 Wings distinctly bicolorous, creamy yellowish near base and suffused with brown anteromedially. Interfrontal area very reduced, not more than half as wide as a parafrontal. Apical scutellar setae exceptionally strong, as large as or larger than the subapicals; subapical scutellar setae widely separated, bases much wider apart than distance from insertion of a subapical seta to its corresponding basal seta . . . . . [**PALIANA** Curran, tribe Sturmiini]
- Wings more or less completely hyaline, at most slightly brownish anterobasally. Interfrontal area not conspicuously narrow, as wide as or only slightly narrower than a parafrontal. Apical scutellar setae (when present) much weaker than subapicals; subapical scutellar setae not unusually widely separated, distance between bases at most only a little greater than distance from base of one subapical to its corresponding basal seta . . . . . 5
- 5 Three *post dc* setae. Basal node of  $R_{4+5}$  with a row of 5-7 setulae that extends nearly half way to cross-vein *r-m*. All frontal setae of ♂ very strongly reclinate. Rather elongate black and silvery forms (with characteristic appearance of scutellum which is sharply divided into silver-and-black halves which reverse in appearance with direction of light) . . . . . **ANEOGMENA** Brauer & Bergenstamm
- Four *post dc* setae. Basal node of  $R_{4+5}$  with only 1-3 setulae. Frontal setae all or mainly inclinate. Not such forms . . . . . 6
- 6 Four sternopleural setae . . . . . 7
- Two or three sternopleural setae . . . . . 8
- 7 Mid tibia with one strong isolated *ad* seta. Eyes densely haired. Abdominal  $T_5$  unusually small, less than half as long as  $T_4$ . Scutellum with apical setae stronger than laterals, crossed and horizontal. **APLOMYA** Robineau-Desvoidy
- Mid tibia with two strong *ad* setae. Eyes virtually bare. Abdominal  $T_5$  normal, nearly as long as  $T_4$ . Scutellum with apical setae weaker than laterals and directed obliquely upwards . . . . . '**Bactromyia**' *crassiseta* Baranov (? genus)
- 8 Parafacials covered with very long conspicuous hair: haired area extending to ventral ends of parafacials and more or less continuous with hairing of the genae. Two sternopleural setae. ♀ with only one pair of proclinate orbital setae
- PSEUDALSOMYIA** Mesnil
- Parafacials usually bare, if some hairing present then either confined to upper halves of parafacials or very short and inconspicuous. Three sternopleural setae (except in *Palia* and some specimens of *Teretrophora*). ♀ with two pairs of proclinate orbital setae . . . . . 9
- 9 Mid tibia with one *ad* seta (very strong and in submedian position) . . . . . 10
- Mid tibia with two or more *ad* setae (setae additional to main one sometimes very small in ♂ of *Teretrophora*) . . . . . 11
- 10 Intermediate abdominal tergites with discal setae. Ocellar setae present. Upper occiput with black setulae behind the postocular row. Hind tibia with a *pd* preapical seta in addition to the normal *d* and *ad* preapicals. Eyes sparsely short-haired. Femora reddish yellow (at most only slightly blackish near the apices) . . . . . **ERYTHROCERA** Robineau-Desvoidy
- Intermediate abdominal tergites without discal setae. Ocellar setae absent.

Upper occiput without black setulae behind the postocular row. Hind tibia without a *pd* preapical seta. Eyes densely long-haired. Femora black-brown

[*PALIA* Curran, tribe Sturmiini]

- 11 Parafacials finely and inconspicuously haired (especially on middle part of their height). Hind tibia with a *pd* preapical seta in addition to the normal *d* and *ad* preapicals. Antennae unicolorous bright orange. Legs reddish yellow (except for the tarsi). Abdomen rather uniformly covered with golden pollinosity in ♂ and ashy grey pollinosity in ♀. Lateral scutellar setae absent

**CHLOROGASTROPSIS** Townsend

- Parafacials bare or with sparse stiff hairs on upper parts. Hind tibia without *pd* preapical seta in addition to the *d* and *ad* preapicals. Lateral scutellar setae present or absent. Antennae not unicolorous orange, at least the third segment extensively brown. Legs largely blackish brown, the femora as well as the tarsi at least partly dark (except in *Aprotheca*). Abdomen not so (but extensively yellowish pollinose in *Aprotheca* ♂) . . . . . 12
- 12 Scutellum without lateral setae. Apical scutellar setae well developed and crossed (one of the pair absent in occasional specimen). Intermediate abdominal tergites without discal setae . . . . . 13
- Scutellum with a pair of long lateral setae. Apical scutellar setae absent or minute, fine and divergent (? *Aprotheca*). Intermediate abdominal tergites with or without discal setae . . . . . 14
- 13 Upper half of parafacials with stiff setulose hairs. Facial ridges bare and widely visible in profile. Eyes densely haired. Vibrissae well above level of epistomal margin. Upper occiput with an irregular row of black setulae behind the postocular row . . . . . **AUSTROPHRYNO** Townsend

- Parafacials completely bare. Facial ridges with very strong downcurved setae on nearly their entire height. Eyes almost bare (some very short sparse hairs visible under high power magnification). Vibrissae level with epistomal margin. Upper occiput without black setulae behind postocular row

**DOLICHOCOLON** Brauer & Bergenstamm

- 14 Legs black or brownish black. Facial region not noticeably warped forwards at the epistome. Facial ridges with strong downcurved setae up most of their height . . . . . 15
- Legs reddish yellow (except for dark tarsi). Facial region strongly warped forwards at the epistome. Facial ridges bare (except for the usual few setulae immediately above vibrissae) . . . . . **APROTHECA** Macquart\*

- 15 Head in profile very strongly subtriangular (Text-fig. 47). Intermediate abdominal tergites each with a pair of strong erect discal setae. Upper occiput with black setulae behind the postocular row. Abdominal T<sub>5</sub> of ♀ normal. Barette bare

**AUSTRONILEA** Crosskey

- Head in profile not strikingly triangular, only a little shorter at the vibrissal axis than at the antennal axis. Intermediate abdominal tergites without discal setae, or one very feeble pair of discals haphazardly developed on T<sub>4</sub>. Upper occiput without black setulae behind the postocular row. Abdominal T<sub>5</sub> of ♀ of extraordinary elongate conical shape (Text-fig. 95), preceding two tergites correspondingly very short and relatively wide. Barette haired

**TERETROPHORA** Macquart

\* The genus *Aprotheca* is known only from Macquart's types that are in very bad condition. They appear to have only three postsutural dorsocentral pores and the *dc* complement in *Aprotheca* may be 3 + 3.

## PART II—A TAXONOMIC CATALOGUE OF THE AUSTRALIAN TACHINIDAE

## INTRODUCTION

The only pre-existing published catalogue of the Australian Tachinidae is that of Malloch (1928b), in which he listed eighty-eight genera and two hundred and twenty-eight species. Malloch's list was essentially only a very preliminary one derived solely from the literature, and Malloch was well aware of its limitations, as is evident from the following paragraph in the preamble to his catalogue which deserves quotation: 'It will be seen that there is quite an array of species included, but it is not to be assumed that all names standing in the list as apparently valid species are in that category. I have not attempted to synonymize species, except where previous workers have already done so, but I know many of the included names will have to be sunk as synonyms of previously described forms appearing in the catalogue. The work of weeding out such synonyms can only be done by someone who will undertake a comprehensive study of the family, and definite identifications will usually depend upon an examination of the type specimens of the species'.

In the forty-four years that have elapsed since Malloch's catalogue there has been considerable, though spasmodic, interest in the taxonomy of Australian Tachinids, and many Australian genera and species have been described since that time (many of them by Malloch himself in his post-1928 papers); in addition, many non-endemic genera have been recognized in the Australian fauna. In the new catalogue that follows a total of 136 genera are treated as valid, and 421 species are listed as valid on the evidence available at the moment (there are, of course, many undescribed genera and species known in museum collections and the figures given are for named taxa only). A large number of names, both generic and specific, are treated as synonyms.

The catalogue is based on a study of very nearly all of the types of Australian Tachinidae that are still in existence (the types are lost or missing in the cases of only 29 out of a total of 487 nominal species-group taxa with an Australian provenance). These studies of the types (including those of the type-species of genera) have made it possible to weed out many of the obvious synonyms, particularly among generic names but very often in the case of specific names also. They have also made it possible to make reliable assignments of described species to currently recognized genera, many of the placements so made involving new combinations (as listed on p. 158). It cannot be claimed that all cases of synonymy between specific names have been unmasked, and it is likely that future critical generic revisionary work will reveal some additional specific synonyms. (In difficult genera where specific criteria are uncertain at present it has been considered best to maintain some or all of the specific names as valid until their true status can be elucidated: cases of suspected synonymy have, however, been indicated.)

## EXPLANATORY INFORMATION ON THE CATALOGUE FORMAT

ARRANGEMENT OF TAXA AND NAMES. Subfamilies are placed in the conventional order beginning with Phasiinae and ending with Goniinae. Tribes are in

systematic order within subfamilies (rather arbitrary positional placements being made for the more aberrant tribes). Genera, subgenera and species treated as valid are listed *alphabetically* within their higher category, as there is no accepted systematic order for their placement. Nomenclatorial synonyms are listed *chronologically* under their respective valid names. Incorrect subsequent spellings and misidentifications are listed after the nomenclatorial synonyms (if any), and each entry of a misidentification is placed in square brackets.

**CITATION OF NAMES AND REFERENCES.** In each entry the name (generic, subgeneric or specific) is cited first, followed by its author and date of publication and the page reference to the work in which the name appeared; the author, year date (letter-suffixed if more than one work by the same author in any year), and page are always sufficient for obtaining the complete reference to the work containing the name from the bibliography. Where a work is best known from a separately paginated reprint version the reprint page reference is given in parentheses immediately after the journal page reference.

The name of the original genus to which any species-group name was assigned when first published is shown in parentheses immediately after the page reference, *but only when different from the present generic assignment* (if no generic name follows the page reference it is *always* to be inferred that the species-group taxon in question was originally placed in the same genus as that in which it is here listed). It is always clear from this convention whether or not any species remains in its original genus, and parentheses have intentionally not been placed around the authors' names for those species that are no longer in their original genera (mainly because the custom of bracketing around the names of authors of transferred species does not lend itself to this type of catalogue in which both year date and page reference are given).

Spellings of names accord with the rigid requirements of the *International Code of Zoological Nomenclature*. Ordinarily the original spelling is the correct one for each name, but as a few of the Australian tachinid genera have a neuter gender (e.g. the names ending in *-stoma* and *-soma*) it has sometimes been necessary to change the endings of adjectival specific names associated with such generic names (to accord with Article 30 of the *Code*). For example, most species here placed in *Senostoma* were originally described in genera with feminine gender and the names originally had feminine endings; on being brought into combination with *Senostoma* (neuter) the endings have had to be changed appropriately. (Here it may be noted that I have no personal sympathy with Article 30, which imposes an unnecessary burden on zoological nomenclature.) In some instances a specific name when first published was associated with an incorrect subsequent spelling of a generic name: when it appears helpful to do so, the incorrect spelling is cited in parentheses after the page reference even though the species in question remains in the same genus.

Citations of the mode of fixation of type-species accord with the *Code*, and are 'original designation', 'monotypy', and 'subsequent designation' (with a reference to the designator given). Many monotypic genera when originally erected had

the type-species originally designated, in which case the mode of fixation is cited solely as 'original designation', but the words 'and monotypy' are added in the few special 'gen. n., sp. n.' situations of the kind covered by Article 68 (a) (i) of the *Code*.

Specific synonyms are indented but their citations and references are dealt with in the same manner as the valid names. All valid names are printed in bold-face italic type and junior synonyms in non-bold italics; other invalid names (incorrect subsequent spellings, nomina nuda, misidentifications, infrasubspecific names, junior primary homonyms in specific names, and junior homonyms in generic names) are also printed in non-bold italics.

When a name was originally proposed for a genus but is now employed in the catalogue as the valid name for a subgenus the words 'as genus' are appended in parentheses after the page reference. Similarly, if a species-group name is now employed in a different status from the original then the original status is indicated in parentheses after the page reference, e.g. 'as var. of *ruficornis*'.

**TYPE-INFORMATION.** The following information is given for the primary type (holotype, lectotype or neotype) of each available species-group name listed in the catalogue: type-status; sex of type; type-locality; type-depository and location; a statement in the form '[examined]' to show when the primary type has been seen personally.

The following points should be noted about the data on primary types.

(1) *Type-status.* The primary type is cited as holotype if it is clear from the original publication that only one specimen was available at the time of description (whether designated in some way as 'type' or not), or if only one specimen is known to exist and there is no published evidence as to how many specimens were present in the type-series; and, of course, whenever a single specimen was designated as type by the original author from a series of specimens. If lectotypes and neotypes have been previously designated references are given to the place of designation. A few lectotypes are newly designated in this work, and each of these is appended 'by present designation' in the body of the catalogue. The expression 'Type(s)' is used for the few cases in which the type-material is lost or missing and it is not known from the original or later publications how many specimens formed the original series.

(2) *Sex of type.* When the actual sex of the primary type is the opposite of that cited in the original description the true sex is given first and the cited sex after it, in the following manner: 'Holotype ♂ [not ♀]'. Such cases are infrequent but occur now and then because of mis-recognition of sex by the earlier authors (e.g. Walker, who was frequently unable to sex Tachinidae correctly). No sex is cited at all in the very few instances in which no type-material has been found or seen and there is no evidence of sex derivable from the original description (e.g. *Linnaemyia nigripalpus* Tryon).

(3) *Type-locality.* In the citations of type-localities the larger territorial units are cited before smaller ones, with the main unit (the Australian state or territory, or if extra-Australian the country or island) shown in capital letters. If the true provenance of the type differs from that cited in the original description then

the true provenance is cited first and is followed by appropriate annotation in square brackets. If the published locality is suspect (e.g. because later collecting has not yielded specimens from the same area) but cannot be shown to be wrong then it is placed in inverted commas, e.g. 'TASMANIA'. Minor discrepancies between the data on a primary type and that shown in the original publication are suitably indicated if their importance warrants it. When citing type-localities that are known more precisely than usual the following abbreviations have been used: 'Is' = island; 'mls' = miles; 'mt' or 'mts' = mountain(s). Points of the compass are abbreviated as N., E., S. and W. and combined as necessary.

(4) *Type-depository and location.* These are shown in parentheses immediately after the type-locality, with the abbreviation for the depository museum given first and followed by the city. If a primary type is lost or has not been located this is stated in parentheses after the type-locality (sometimes with some amplifying words if pertinent). The abbreviations used for the museum depositories are as follows:

AM	Australian Museum, Sydney
AMNH	American Museum of Natural History, New York
ANIC	Australian National Insect Collection, Canberra
BMNH	British Museum (Natural History), London
CNC	Canadian National Collection, Ottawa
DEI	Deutsches Entomologisches Institut, Eberswalde
MHN	Musée d'Histoire Naturelle, Lille
MNHN	Muséum National d'Histoire Naturelle, Paris
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin
MRAC	Musée Royal de l'Afrique Centrale, Tervuren
MZ	Museo Zoologico 'La Specola', Florence
NM	Naturhistorisches Museum, Vienna
NMV	National Museum of Victoria, Melbourne
NR	Naturhistoriska Riksmuseum, Stockholm
NSWDA	New South Wales Department of Agriculture, Rydalmere
QM	Queensland Museum, Brisbane
RMNH	Rijksmuseum van Natuurlijke Historie, Leiden
SPHTM	School of Public Health and Tropical Medicine, Sydney
USNM	United States National Museum, Washington D.C.
UZM	Universitetets Zoologiske Museum, Copenhagen
WADA	Western Australian Department of Agriculture, Perth
ZM	Zoologisch Museum, Amsterdam

(5) *Localities of extra-Australian type-species.* It may conveniently be noted here that statements of the original provenance of the type-species of genus-group names are given only for those names that are based on extra-Australian type-species. For example *Calozenillia* is based on a type-species from Sumatra, and the locality 'Sumatra' is therefore given in parentheses at the end of the generic entry. Localities are *not* given in the generic synonymies for the names

based on Australian type-species, as the latter are listed with their type-localities in the catalogue of species that accompanies each generic (or subgeneric) name.

**GEOGRAPHICAL DISTRIBUTION.** An attempt has been made to provide a brief synopsis of the known distribution of each species listed as *valid* in the catalogue. Geographical data is given to the level of state or territory for Australia itself, and to the level of island(s), country or zoogeographical region, as appropriate, for species that occur extra-limitally as well as in Australia. Australian distribution is given first, with the states listed alphabetically, followed by extra-limital distribution (if any); the extra-limital distribution is listed with the areas closest to Australia (e.g. New Guinea) first and more distant areas afterwards. If there is only doubtful evidence of the occurrence of a particular species in any Australian state, or if a published record from a state appears suspect, then the state(s) in question are listed at the end of the Australian distribution and are followed by a query mark: for example, *Blepharipa fulviventris* is recorded as from 'N.S.W., QLD, TASM. (?)', this format indicating that records from New South Wales and Queensland are considered confirmed but from Tasmania doubtful (if records from two or more states are doubtful then a query mark follows the entry for each such state). The abbreviations used for listing Australian states and territories are as follows:

A.C.T.	Australian Capital Territory	S.A.	South Australia
N.S.W.	New South Wales	TASM.	Tasmania
N.T.	Northern Territory	VICT.	Victoria
QLD	Queensland	W.A.	Western Australia

Lord Howe Island is listed separately from New South Wales and is not abbreviated.

**NOMENCLATURAL CHANGES.** It has been necessary to establish in the catalogue several new generic and specific synonymies, many new combinations for generically re-assigned species, and a few new names for preoccupied homonyms: a summary of these changes is provided on p. 157. The usual bold-face abbreviations have been used to signify these changes, viz. **Comb. n.** (new combination), **Nom. n.** (new name) and **Syn. n.** (new synonym). New combinations are only marked as such when considered taxonomically valid; species-group names that are assigned for the first time to a particular generic taxon are not marked as new combinations if they are also junior synonyms (as in these instances there are no valid new binomina in use). The abbreviation **Comb. n.** when given is placed after the type-locality data (which concludes the essentially nomenclatorial matter) and before the distributional data in the body of the catalogue, and each new taxonomically valid binomen is set out formally in the summary of new combinations (p. 158).

**MISCELLANEOUS ANNOTATIONS.** Whenever it is necessary or desirable to call attention to some specially pertinent point concerning a species-group name appearing in the catalogue (e.g. to elucidate points of homonymy, possible

whereabouts of types, mis-citations of dates, etc.) the additional annotation is given in a separate paragraph immediately following the main entry.

#### SYNOPSIS OF THE CATALOGUE ARRANGEMENT OF TRIBES AND GENERA

The following synopsis is given to show at a glance the arrangement of tribes and genera in the body of the catalogue. The genera listed are those considered valid at the present time. The affinities of several Australian genera are particularly obscure, and some have had to be assigned to tribes rather arbitrarily; likewise, the appropriate subfamily assignments of some tribes are doubtful. All such cases of doubtfully assigned genera and tribes are indicated by an asterisk (\*) against the name; taxa so marked are in special need of study to ascertain their relationships more clearly.

#### Subfamily PHASIINAE

##### Tribe TRICHOPODINI

*Pentatomophaga* de Meijere

*Saralba* Walker

##### Tribe PHASIINI

*Alophora* Robineau-Desvoidy

*Besserioides* Curran

*Eftayloria* Malloch

##### Tribe CYLINDROMYIINI

*Cylindromyia* Meigen

*Gerocyptera* Townsend

##### Tribe LEUCOSTOMATINI

*Leucostoma* Meigen

##### Tribe EUTHERINI

*Euthera* Loew

#### Subfamily PROSENINAE (DEXIINAE)

##### Tribe PROSENINI

*Acucera* Malloch

*Anatropomyia* Malloch

*Geraldia* Malloch

*Heterometopia* Macquart\*

*Hobartia* Malloch

*Macropodexia* Townsend

*Ola* Paramonov

*Platytainia* Macquart

*Prosenia* Le Peletier & Serville

*Prosenina* Malloch

*Rutilotrixia* Townsend

*Senostoma* Macquart

*Trichostylum* Macquart

##### Tribe RUTILIINI

*Amphibolia* Macquart

*Chetogaster* Macquart

*Chrysopasta* Brauer & Bergenstamm  
*Formosia* Guérin-Ménéville  
*Prodiaphania* Townsend  
*Rutilia* Robineau-Desvoidy

## Subfamily TACHININAE (MACQUARTIINAE)

### Tribe PALPOSTOMATINI\*

*Apalpostoma* Malloch  
*Eustacomys* Malloch  
*Palpostoma* Robineau-Desvoidy

### Tribe MYIOTRIXINI\*

*Myiotrixia* Brauer & Bergenstamm

### Tribe ORMIINI\*

*Therobia* Brauer

### Tribe GLAUROCARINI\*

*Doddiana* Curran

### Tribe CAMPYLOCHETINI

*Elpe* Robineau-Desvoidy

### Tribe VORIINI

*Hyleorus* Aldrich  
*Hystricovoria* Townsend  
*Voria* Robineau-Desvoidy

### Tribe THELAIRINI

*Halydaia* Egger  
*Thelaira* Robineau-Desvoidy

### Tribe MINTHOINI

*Minthoxia* Mesnil  
*Sumpigaster* Macquart

### Tribe NEMORAEINI

*Nemoraea* Robineau-Desvoidy

### Tribe LESKIINI

*Apatemyia* Macquart  
*Demoticoidea* Mesnil  
*Exechopalpus* Macquart  
*Rhinomyobia* Brauer & Bergenstamm  
*Sipholeskia* Townsend  
*Toxocnemis* Macquart

### Tribe ERNESTIINI

*Amphitropesa* Townsend\*  
*Chlorotachina* Townsend  
*Macrochloia* Malloch  
*Neximyia* Crosskey\*

### Tribe PARERIGONINI\*

*Australotachina* Curran\*  
*Leverella* Baranov  
*Pygidimyia* Crosskey  
*Zita* Curran

## Tribe LINNAEMYINI

- Apalpus* Malloch
- Chaetophthalmus* Brauer & Bergenstamm
- Linnaemya* Robineau-Desvoidy

## Tribe TACHININI

- Cuphocera* Macquart
- Eristaliomyia* Townsend
- Microtropesa* Macquart

## Subfamily GONIINAE

## Tribe ACEMYINI

- Ceracia* Rondani

## Tribe NEAERINI

- Voriella* Malloch

## Tribe SIPHONINI (ACTIINI)

- Actia* Robineau-Desvoidy
- Ceromya* Robineau-Desvoidy
- Peribaea* Robineau-Desvoidy

## Tribe BLONDELIINI

- Anagonia* Brauer & Bergenstamm
- Compsilura* Bouché
- Deltomyza* Malloch
- Froggattimyia* Townsend
- Lecanipa* Rondani
- Lixophaga* Townsend
- Medinodexia* Townsend
- Monoleptophaga* Baranov
- Pareupogona* Townsend
- Paropsivora* Malloch
- Pilimyia* Malloch
- Trigonospila* Pokorný
- Zenargomyia* Crosskey
- Zosteromeigenia* Townsend

## Tribe EXORISTINI

- Austrophorocera* Townsend
- Chaetoria* Becker
- Eozenillia* Townsend
- Exorista* Meigen
- Hillomyia* Crosskey nom. n.
- Spoggosia* Rondani
- Stomatomyia* Brauer & Bergenstamm

## Tribe ETHILLINI

- Ethilla* Robineau-Desvoidy
- Mycteromyiella* Mesnil\*
- Phorocerosoma* Townsend

## Tribe WINTHEMIINI

- Crypsina* Brauer & Bergenstamm
- Nemorilla* Rondani
- Winthemia* Robineau-Desvoidy

## Tribe CARCELIINI

- Argyrophylax* Brauer & Bergenstamm
- Argyrothelaira* Townsend
- Carcelia* Robineau-Desvoidy
- Carcelimyia* Mesnil

## Tribe ANACAMPTOMYIINI

- Anacamptomyia* Bischof
- Euvespivora* Baranov
- Koralliomyia* Mesnil\*

## Tribe STURMIINI

- Anamastax* Brauer & Bergenstamm
- Arrhenomyza* Malloch
- Blepharella* Macquart
- Blepharipa* Rondani
- Calozenillia* Townsend
- Eurygastropsis* Townsend
- Palexorista* Townsend
- Palia* Curran\*
- Paliana* Curran\*
- Paradrino* Mesnil
- Paragonia* Mesnil
- Polychaeta* Macquart
- Quadra* Malloch
- Sisyropa* Brauer & Bergenstamm
- Sturmia* Robineau-Desvoidy
- Tasmaniomysia* Townsend
- Tritarys* Macquart
- Ugimeigenia* Townsend
- Winthellia* Crosskey
- Zebromyia* Malloch
- Zygobothria* Mik

## Tribe GONIINI

- Goniophthalmus* Villeneuve
- Pseudogonia* Brauer & Bergenstamm

## Tribe ERYCIINI

- Aplomya* Robineau-Desvoidy
- Aprotheca* Macquart
- Austronilea* Crosskey
- Austrophryno* Townsend
- Bactromyiella* Mesnil\*
- Chlorogastropsis* Townsend
- Erythroceras* Robineau-Desvoidy
- Metaphryno* Crosskey
- Phorocerosoma* Malloch
- Pseudalsomyia* Mesnil
- Teretrophora* Macquart

## THE TAXONOMIC CATALOGUE

Family **TACHINIDAE** Robineau-Desvoidy

**TACHINARIAE** Robineau-Desvoidy, 1830 : 185. Type-genus: *Tachina* Meigen, 1803.

Subfamily **PHASIINAE** Robineau-Desvoidy

**PHASIANEAE** Robineau-Desvoidy, 1830 : 280. Type-genus: *Phasia* Latreille, 1804.

Tribe **TRICHOPODINI** Townsend

**TRICHOPODINI** Townsend, 1908 : 129. Type-genus: *Trichopoda* Latreille, 1825.

Genus **PENTATOMOPHAGA** de Meijere

*Pentatomophaga* de Meijere, 1917 : 246. Type-species: *Pentatomophaga bicincta* de Meijere, 1917, by monotypy. (JAVA).

***bicincta*** de Meijere, 1917 : 247. Holotype ♀, JAVA (ZM, Amsterdam) [examined].—QLD; JAVA; NEW BRITAIN.

Genus **SARALBA** Walker

*Saralba* Walker, 1865 : 114. Type-species: *Saralba ocypteroides* Walker, 1865, by monotypy. (NEW GUINEA).

*Pseudotrichopoda* Malloch, 1933a : 77. Type-species: *Pseudotrichopoda varipes* Malloch, 1933 [= *Saralba ocypteroides* Walker, 1865], by original designation.

***bancrofti*** Paramonov, 1956 : 373. Holotype ♂, QUEENSLAND, Eidsvold (ANIC, Canberra) [examined].—QLD. (Probably = *ocypteroides*).

***ocypteroides*** Walker, 1865 : 114. Holotype ♂, NEW GUINEA (BMNH, London) [examined].—QLD; NEW GUINEA.

*varipes* Malloch, 1933a : 78 (*Pseudotrichopoda*). Holotype ♂, QUEENSLAND, Cairns (DEI, Eberswalde) [examined].

Tribe **PHASIINI** Robineau-Desvoidy

**PHASIANEAE** Robineau-Desvoidy, 1830 : 280. Type-genus: *Phasia* Latreille, 1804.

Genus **ALOPHORA** Robineau-Desvoidy

*Alophora* Robineau-Desvoidy, 1830 : 293. Type-species: *Syrphus hemipterus* Fabricius, 1794, by subsequent designation of Coquillett (1910 : 505). (EUROPE).

*Allophora*. Incorrect subsequent spelling of *Alophora* Robineau-Desvoidy.

Subgenus **ALOPHORELLA** Townsend

*Alophorella* Townsend, 1912 : 45. Type-species: *Thereva obesa* Fabricius, 1798, by original designation. (EUROPE).

*Austrophasia* Townsend, 1916f : 45. Type-species: *Hyalomya rufiventris* Macquart, 1851, by original designation.

- aureiventris** Curran, 1927a : 165. Holotype ♂, QUEENSLAND: Biloela (BMNH, London) [examined]. – QLD.
- chrysis** Malloch, 1930a : 95 (*Hyalomyia*). Holotype ♂, WESTERN AUSTRALIA: Narragin (SPHTM, Sydney) [examined]. **Comb. n.** – W.A.
- costalis** Malloch, 1929 : 284 (*Hyalomyia*). Holotype ♂, NEW SOUTH WALES: Woodford (ANIC, Canberra) [examined]. **Comb. n.** – N.S.W.
- discalis** Malloch, 1930a : 95 (*Hyalomyia*). Holotype ♂, WESTERN AUSTRALIA: Geraldton (SPHTM, Sydney). **Comb. n.** – W.A., QLD (?), TASM. (?).
- rufiventris** Macquart, 1851 : 188 (215) (*Hyalomyia*). Holotype ♂, 'TASMANIA' (MNHN, Paris) [examined]. – TASM. (?).

#### Subgenus **HYALOMYA** Robineau-Desvoidy

- Hyalomyia* Robineau-Desvoidy, 1830 : 298 (as genus). Type-species: *Phasia semicinerea* Meigen, 1824 [= *Phasia pusilla* Meigen, 1824], by subsequent designation of Westwood (1840 : 140). (EUROPE).
- Hyalomyia*. Incorrect subsequent spelling of *Hyalomyia* Robineau-Desvoidy.
- normalis** Curran, 1927b : 355 (*Strongylogaster*). Holotype ♀, QUEENSLAND: Palmerston (DEI, Eberswalde) [examined]. **Comb. n.** – QLD.

#### Subgenus **MORMONOMYIA** Brauer & Bergenstamm

- Mormonomyia* Brauer & Bergenstamm, 1891 : 388 (84) (as genus). Type-species: *Mormonomyia laniventris* Brauer & Bergenstamm, 1891 [= *Phasia argentifrons* Walker, 1849], by subsequent designation of Townsend (1916a : 8). (SOUTH AFRICA).
- basalis** Malloch, 1930a : 96 (*Hyalomyia*). Holotype ♂, NEW SOUTH WALES: Wahroonga (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- hyalis** Malloch, 1930a : 96 (*Hyalomyia*). Holotype ♂, NEW SOUTH WALES: Como (USNM, Washington) [examined]. **Comb. n.** – N.S.W.
- lativentris** Malloch, 1929a : 110 (*Hyalomyia*). Holotype ♂, QUEENSLAND: Cairns (USNM, Washington) [examined]. **Comb. n.** – QLD.
- lepidofera** Malloch, 1929a : 111 (*Hyalomyia*). Holotype ♂, NEW SOUTH WALES: Como (USNM, Washington) [examined]. **Comb. n.** – N.S.W.
- nigrihirta** Malloch, 1929a : 112 (*Hyalomyia*). Holotype ♂, VICTORIA: Seaford (USNM, Washington) [examined]. **Comb. n.** – QLD, VICT.
- sensua** Curran, 1927b : 354 (*Strongylogaster*). Holotype ♀, QUEENSLAND: Palmerston (DEI, Eberswalde) [examined]. **Comb. n.** – QLD.

#### Subgenerically unplaced species of *Alophora* s.l.

- hippobosca** Paramonov, 1958 : 594 (*Hyalomyia*). Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Canberra (ANIC, Canberra) [examined]. **Comb. n.** – A.C.T., VICT.

This species is close to subgenus *Alophorella* but the parafrontals are bare outside the frontal rows; it comes closest to the Palaearctic subgenus *Phoranthia* Rondani.

- nigrisquama** Malloch, 1929a : 110 (*Hyalomyia*). Holotype ♂, NEW SOUTH WALES: N. Sydney, French's Forest (AM, Sydney) [examined]. **Comb. n.** – N.S.W.

This species has the face and epistome flat in profile and the subgenus is uncertain. It comes closest to the Palaearctic subgenus *Brumptalophora* Dupuis.

#### Genus **BESSERIOIDES** Curran

- Besserioides* Curran, 1938 : 185. Type-species: *Besserioides sexualis* Curran, 1938 [= *Catharosia varicolor* Curran, 1927], by original designation.

- bancrofti** Paramonov, 1958 : 597. Holotype ♂, QUEENSLAND, Palm Is. (ANIC, Canberra) [examined]. – QLD.
- latifrons** Paramonov, 1958 : 596. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY, Bendora (ANIC, Canberra) [examined]. – A.C.T.
- varicolor** Curran, 1927a : 165 (*Catharosia*). Holotype ♂, QUEENSLAND, Bileola (BMNH, London) [examined]. – QLD.
- sexualis** Curran, 1938 : 185. Holotype ♂, QUEENSLAND, Laidley (BMNH, London) [examined]. – **Syn. n.**

### Genus **EFFTAYLORIA** Malloch

- Tayloria* Malloch, 1930a : 98. Type-species: *Tayloria testacea* Malloch, 1930, by original designation. [Junior homonym of *Tayloria* Bourguignat, 1889.]
- Efftayloria* Malloch, 1941 : 64. [Replacement name for *Tayloria* Malloch.]
- testacea** Malloch, 1930a : 98 (*Tayloria*). Holotype ♂, QUEENSLAND, Mt Molloy (SPHTM, Sydney) [examined]. – QLD. (Possibly = *ochromyoides* Walker, 1865, New Guinea).

### Tribe **CYLINDROMYIINI** Townsend

CYLINDROMYIINI Townsend, 1912 : 48. Type-genus: *Cylindromyia* Meigen, 1803.

### Genus **CYLINDROMYIA** Meigen

- Cylindromyia* Meigen, 1803 : 279. Type-species: *Musca brassicaria* Fabricius, 1775, by monotypy. (EUROPE).
- Ocypteropsis* Townsend, 1916b : 630. Type-species: *Ocyptera flavifrons* Macquart, 1851 [= *Ocyptera bimacula* Walker, 1849], by original designation.
- [*Ocyptera* Latreille sensu authors (misidentification)]
- angustissimifrons** Paramonov, 1956 : 365. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Mt Gingera (ANIC, Canberra) [examined]. – A.C.T.
- aterrima** Paramonov, 1956 : 361. Holotype ♂, QUEENSLAND: Scottsville (ANIC, Canberra) [examined]. – QLD.
- atrata** Malloch, 1930b : 314. Holotype ♀, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.
- bicolor** Bigot, 1885c : lv (*Glossidionophora*). Holotype ♀, AUSTRALIA (BMNH, London) [examined]. – State unknown.
- C. bicolor* Bigot is a junior secondary homonym of *C. bicolor* Olivier, 1811. No new name is proposed at the present time.
- bimacula** Walker, 1849 : 694 (*Ocyptera*). Holotype ♂, TASMANIA (BMNH, London) [examined]. – A.C.T., N.S.W., S.A., TASM., W.A.
- flavifrons** Macquart, 1851 : 187 (214) (*Ocyptera*). Lectotype ♂ (by designation of Crosskey, 1971 : 280), TASMANIA (MNHN, Paris) [examined]. **Syn. n.**
- brunnea** Malloch, 1930b : 315. Holotype ♂, WESTERN AUSTRALIA: Perth (ANIC, Canberra) [examined]. – W.A.
- dayi** Paramonov, 1956 : 369. Holotype ♂, NEW SOUTH WALES: Killara (ANIC, Canberra) [examined]. – N.S.W.
- fenestrata** Paramonov, 1956 : 363. Holotype ♂, QUEENSLAND: Gayndah (AM, Sydney) [examined]. – QLD.
- hobartana** Paramonov, 1956 : 368. Holotype ♂, TASMANIA: Hobart (ANIC, Canberra) [examined]. – TASM.
- howeana** Paramonov, 1956 : 364. Holotype ♂, LORD HOWE ISLAND (ANIC, Canberra) [examined]. – LORD HOWE I.

- nigricosta** Malloch, 1930b : 312. Holotype ♂ [two wings only remaining], NEW SOUTH WALES: Kosciusko (SPHTM, Sydney) [examined]. – N.S.W.
- rieki** Paramonov, 1956 : 370. Holotype ♂, TASMANIA: Eagle Hawk Neck (ANIC, Canberra) [examined]. – TASM.
- rufifemur** Paramonov, 1956 : 366. Holotype ♂, NEW SOUTH WALES: Salisbury Downs-Clifton Downs (ANIC, Canberra) [examined]. – N.S.W., QLD.
- sydneyensis** Malloch, 1930b : 314. Holotype ♀, NEW SOUTH WALES: Sydney (ANIC, Canberra) [examined]. – N.S.W.
- tricolor** Malloch, 1930b : 315. Holotype ♀, NEW SOUTH WALES: Killara, Allowrie (SPHTM, Sydney) [examined]. – N.S.W.
- unguiculata** Paramonov, 1956 : 370. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Blundell's (ANIC, Canberra) [examined]. – A.C.T., QLD., W.A.
- westralica** Paramonov, 1956 : 367. Holotype ♂, WESTERN AUSTRALIA: King George's Sound (AM, Sydney) [examined]. – W.A.

### Genus *GEROCYPTERA* Townsend

- Gerocyptera* Townsend, 1916e : 178. Type-species: *Trichoprosopa marginalis* Walker, 1860, by original designation. (MOLUCCAS).
- tristis** Bigot, 1878 : 45 (*Ocyptera*). Holotype ♂, 'AUSTRALIA' (BMNH, London) [examined]. **Comb. n.** – AUSTRALIA (?).

### Tribe *LEUCOSTOMATINI* Townsend

*LEUCOSTOMINI* Townsend, 1908 : 76. Type-genus: *Leucostoma* Meigen, 1803.

### Genus *LEUCOSTOMA* Meigen

- Leucostoma* Meigen, 1803 : 279. Type-species: *Ocyptera simplex* Fallén, 1815, by subsequent monotypy (Meigen, 1824 : 234). (EUROPE).
- Aequia* Malloch, 1930b : 325. Inadvertent error for *Leucostoma*, published in the statement 'The preceding genus, *Aequia*, is distinguished from the present one [*Hyalomyodes*] by the strong erect ocellar bristles, and the wing venation'. Here held to be a name first published as a synonym and unavailable under Article 11(d) of the *International Code of Zoological Nomenclature*. (See also Townsend, 1938 : 189).
- simplex** Fallén, 1815 : 240 (*Ocyptera*). Holotype ♀, SWEDEN: Kalmar (NR, Stockholm) [examined]. – N.S.W.; widespread Holarctic regions, also Neotropical region.

### Tribe *EUTHERINI* Townsend

*EUTHERINI* Townsend, 1912 : 49. Type-genus: *Euthera* Loew, 1866.

### Genus *EUTHERA* Loew

- Euthera* Loew, 1866 : 46. Type-species: *Euthera tentatrix* Loew, 1866, by monotypy. (UNITED STATES OF AMERICA).
- Macreuthera* Bezzi, 1925 : 281 (as subg. of *Euthera*). Type-species: *Euthera skusei* Bezzi, 1925, by original designation.
- rieki** Paramonov, 1953 : 207. Holotype ♂, QUEENSLAND: Wairi Border Gate-Narylco (ANIC, Canberra) [examined]. – QLD.

**skusei** Bezzi, 1925 : 281. Holotype ♀, QUEENSLAND: Eidsvold (whereabouts unknown, possibly lost). – QLD.

Holotype should be in SPHTM, Sydney, but has not been located.

### Unplaced species of Phasiinae

**australasiae** Malloch, 1930b : 325 (*Hyalomyodes*). Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.

Placed by Malloch in New World genus *Hyalomyodes* Townsend but probably does not belong there.

### Subfamily PROSENINAE Townsend

PROSENINAE Townsend, 1892b : 273. Type-genus: *Prosenia* Le Peletier & Serville, 1828.

### Tribe PROSENINI Townsend

PROSENINAE Townsend, 1892b : 273. Type-genus: *Prosenia* Le Peletier & Serville, 1828.

### Genus ACUCERA Malloch

*Acucera* Malloch, 1930b : 328. Type-species: *Acucera montana* Malloch, 1930, by original designation.

**montana** Malloch, 1930b : 328. Holotype ♂, NEW SOUTH WALES: Blue Mts (SPHTM, Sydney) [examined]. – N.S.W.

### Genus ANATROPOMYIA Malloch

*Anatropomyia* Malloch, 1930a : 126. Type-species: *Anatropomyia flavicornis* Malloch, 1930, by original designation.

**flavicornis** Malloch, 1930a : 127. Holotype ♂, NEW SOUTH WALES: Ilford (SPHTM, Sydney) [examined]. – N.S.W.

### Genus GERALDIA Malloch

*Geraldia* Malloch, 1930b : 327. Type-species: *Geraldia hirticeps* Malloch, 1930, by original designation.

**hirticeps** Malloch, 1930b : 328. Holotype ♂, WESTERN AUSTRALIA: Geraldton (SPHTM, Sydney) [examined]. – S.A., W.A.

### Genus HETEROMETOPIA Macquart

*Heterometopia* Macquart, 1846 : 298 (170). Type-species: *Heterometopia argentea* Macquart, 1846, by monotypy.

*Cystometopia* Townsend, 1926 : 531. Type-species: *Heterometopia rufipalpis* Macquart, 1847 [= *Heterometopia argentea* Macquart, 1846], by original designation.

- argentea** Macquart, 1846 : 298 (170). Lectotype ♂ (by designation of Crosskey, 1971 : 271), TASMANIA (MNHN, Paris) [examined]. – TASM.
- limbinevris** [sic] Macquart, 1846 : 317 (189) (*Omalogaster*). Holotype ♀ [not ♂], TASMANIA (MNHN, Paris) [examined]. **Syn. n.**
- nitidus** Macquart, 1846 : 318 (190) (*Omalogaster*). Type(s), TASMANIA (lost). **Syn. n.**
- rufipalpis** Macquart, 1847 : 90 (74). Holotype ♂ [not ♀], AUSTRALIA (BMNH, London) [examined]. **Syn. n.**
- analis** Macquart, 1851 : 182 (209). Lectotype ♀ (by designation of Crosskey, 1971 : 271), TASMANIA (MNHN, Paris) [examined].
- bella** Paramonov, 1960 : 692. Holotype ♂, NEW SOUTH WALES: 10 mls SE of Braidwood (ANIC, Canberra) [examined]. – A.C.T., N.S.W.
- montana** Paramonov, 1960 : 693. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Bendora (ANIC, Canberra) [examined]. – A.C.T., N.S.W., VICT.

### Genus *HOBARTIA* Malloch

- Hobartia* Malloch, 1930a : 127. Type-species: *Hobartia peculiaris* Malloch, 1930, by original designation.
- peculiaris** Malloch, 1930a : 127. Holotype ♂, TASMANIA: Hobart (ANIC, Canberra) [examined]. – TASM.

### Genus *MACROPODEXIA* Townsend

- Macropodexia* Townsend, 1933 : 462. Type-species: *Dexia longipes* Macquart, 1846, by original designation.
- longipes** Macquart, 1846 : 315 (187) (*Dexia*). Lectotype ♂ (by designation of Crosskey, 1971 : 266), TASMANIA (MNHN, Paris) [examined]. – N.S.W., TASM., VICT.

### Genus *OLA* Paramonov

- Ola* Paramonov, 1968 : 377. Type-species: *Rutilia nigrithorax* Macquart, 1851, by original designation.
- erasmusi** Paramonov, 1968 : 381. Holotype ♂, VICTORIA: Warburton (NMV, Melbourne). – VICT.
- insectaria** Paramonov, 1968 : 380. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Canberra (ANIC, Canberra). – A.C.T., N.S.W.
- nigrithorax** Macquart, 1851 : 190 (217) (*Rutilia*). Lectotype ♂ (by designation of Crosskey, 1971 : 288), AUSTRALIA [publ. as 'Oceania'] (MNHN, Paris) [examined]. – A.C.T., N.S.W., TASM., VICT.
- wilsoni** Paramonov, 1954 : 281 (*Chaetogaster*). Holotype ♂, NEW SOUTH WALES: Blackheath (NMV, Melbourne). – N.S.W., VICT.

### Genus *PLATYTAINIA* Macquart

- Platytaenia* Macquart, 1851 : 178 (205). Type-species: *Platytaenia maculata* Macquart, 1851, by monotypy.
- maculata** Macquart, 1851 : 179 (206). Holotype ♀, 'TASMANIA' (MNHN, Paris) [examined]. – N.S.W., TASM. (?).

Genus *PROSENA* Le Peletier & Serville

*Calirrhoe* Meigen, 1800 : 39. [Name suppressed by I.C.Z.N. Opinion 678 (1963 : 339)]

*Prosenia* Le Peletier & Serville, 1828 : 499, 500. Type-species: *Stomoxys siberita* Fabricius, 1775, by original designation. (DENMARK).

*arcuata* Malloch, 1932a : 129. Holotype ♂, NEW SOUTH WALES: Killara, Allowrie (SPHTM Sydney) [examined]. – N.S.W.

*argentata* Curran, 1927b : 348. Holotype ♂, QUEENSLAND: Kuranda (DEI, Eberswalde). – QLD.

*P. argentata* Curran is a junior primary homonym of *P. argentata* Walker, 1859. No new name is proposed at the present time.

*bella* Curran, 1927b : 349. Holotype ♂, QUEENSLAND: Cairns (DEI, Eberswalde). – QLD.

*bisetosa* Malloch, 1932a : 130. Holotype ♂, QUEENSLAND: Cairns district (SPHTM, Sydney) [examined]. – QLD., N.S.W. (?).

*conica* Guérin-Méneville, 1831 : Plate 21, fig. 7, 7A; 1838 : 298. Holotype ♂, NEW SOUTH WALES: Port Jackson (=Sydney) (MNHN, Paris) [examined]. – N.S.W., QLD.

*albifrons* Malloch, 1932a : 132. Holotype ♂, QUEENSLAND: Eidsvold (not located). **Syn. n.** [*argentata* Curran sensu Malloch, 1930 (misidentification)]

*dimidiata* Curran, 1938 : 188. Holotype ♀, QUEENSLAND: Kuranda (SPHTM, Sydney) [examined]. – QLD.

*dispar* Macquart, 1851 : 203 (230). Lectotype ♀ (by designation of Crosskey, 1971 : 284), 'TASMANIA' (MNHN, Paris) [examined]. – N.S.W., TASM. (?).

*doddi* Curran, 1927b : 347. Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde). – N.T., QLD. (= *siberita* Fabricius according to Malloch, 1932a : 131).

*dorsalis* Macquart, 1847 : 97 (81). Holotype ♂, TASMANIA (BMNH, London) [examined]. – N.S.W., TASM.

*parva* Malloch, 1930a : 115. Holotype ♀, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. **Syn. n.**

*jactans* Walker, 1858 : 210 (*Pachymyia*). Holotype ♀ [? AUSTRALIA] (BMNH, London) [examined]. – N.S.W., QLD.

*macropus* Thomson, 1869 : 531. Holotype ♂, NEW SOUTH WALES: Sydney (NR, Stockholm) [examined]. – N.S.W., TASM.

*indecisa* Malloch, 1930a : 116. Holotype ♂, NEW SOUTH WALES: Barrington Tops (not located). **Syn. n.**

Paratypes undoubtedly conspecific with missing holotype are in USNM, Washington, and SPHTM, Sydney [examined].

*malayana* Townsend, 1926a : 25 (*Calirrhoe*). Lectotype ♂ (by designation of Crosskey, 1969 : 91), SUMATRA: Fort de Kock (ZM, Amsterdam) [examined]. – QLD.; widespread S.E. ASIA. (Possibly = *siberita*).

*P. malayana* was considered by Curran (1938 : 189) to be a senior synonym of *P. doddi*. Evidence is inconclusive.

*marginalis* Curran, 1938 : 189. Holotype ♂, QUEENSLAND: Brisbane (SPHTM, Sydney) [examined]. – QLD.

*nigripes* Curran, 1927b : 347. Holotype ♂, QUEENSLAND: Palmerston (DEI, Eberswalde). – N.T., QLD. (Probably = *malayana*).

*rufiventris* Macquart, 1847 : 96 (80). Holotype ♀, 'TASMANIA' (BMNH, London) [examined]. – QLD., TASM. (?).

*siberita* Fabricius, 1775 : 798 (*Stomoxys*). Type(s), DENMARK: Copenhagen (lost). – N.S.W., QLD.; widespread EUROPE and ASIA. (Possibly misidentified from Australia)

*sibirita*. Incorrect subsequent spelling of *siberita* Fabricius.

*confusa* Malloch, 1930a : 115 (as var. of *siberita*). Holotype ♂, QUEENSLAND: Eidsvold (SPHTM, Sydney) [examined].

*surda* Curran, 1938 : 190. Holotype ♂, QUEENSLAND: Kuranda (BMNH, London, ex coll. Wainwright) [examined]. – N.S.W., QLD., W.A.

- tenuis** Malloch, 1930a : 114. Holotype ♂, NEW SOUTH WALES: Gundamain National Park (SPHTM, Sydney) [examined]. – N.S.W., QLD. (?).
- varia** Curran, 1929 : 509. Holotype ♂, NEW SOUTH WALES (not located). – N.S.W.
- variegata** Curran, 1929 : 509. Holotype ♂, QUEENSLAND: Gravesend (SPHTM, Sydney) [examined]. – QLD.
- vittata** Guérin-Méneville, 1838 : 299. Holotype ♀, NEW SOUTH WALES: Port Jackson (=Sydney) (MNHN, Paris) [examined]. – N.S.W.
- vittata** Macquart, 1843 : 249 (92). Holotype ♀, NEW SOUTH WALES: Port Jackson (=Sydney) (MNHN, Paris) [examined]. Junior primary homonym and junior objective synonym of *P. vittata* Guérin-Méneville.

It is considered certain (Crosskey, 1971 : 284–285) that Macquart described his *P. vittata* from the same female specimen from Port Jackson that Guérin-Méneville had already used as the basis of his *P. vittata*, Macquart apparently being unaware of Guérin-Méneville's description. *P. vittata* Macquart has therefore the status of a junior objective synonym and junior homonym of *P. vittata* Guérin-Méneville.

Macquart (1843 : 249) considered that *vittata* might be the female of *P. conica* Guérin-Méneville. As the male holotype of *conica* and the female holotype of *vittata* (both from Port Jackson) are mounted and labelled exactly similarly it is almost certain that they were collected at the same time, and probable that the sexes associate. Synonymy is not established at present.

### Genus **PROSENINA** Malloch

- Prosenina** Malloch, 1930a : 116. Type-species: *Prosenina nicholsoni* Malloch, 1930, by original designation.
- nicholsoni** Malloch, 1930a : 116. Holotype ♂, NEW SOUTH WALES: Gundamain National Park (ANIC, Canberra) [examined]. – N.S.W., TASM., W.A.

### Genus **RUTILOTRIXA** Townsend

- Rutilotrixa** Townsend, 1933 : 448. Type-species: *Trixa lateralis* Walker, 1849, by original designation.
- Ruya** Paramonov, 1968 : 381. Type-species: *Chaetogaster diversa* Paramonov, 1954, by original designation. **Syn. n.**
- diversa** Paramonov, 1954 : 280 (*Chaetogaster*). Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Blundell's (ANIC, Canberra) [examined]. **Comb. n.** – A.C.T., N.S.W., VICT. (Probably = *lateralis*).
- lateralis** Walker, 1849 : 698 (*Trixa*). Holotype ♀, [AUSTRALIA] (BMNH, London) [examined]. – AUSTRALIA (state unknown, probably N.S.W.).
- No locality was given in the original description; Townsend (1933 : 448) rightly cited Australia from evidence at the BMNH.
- monstruosa** Paramonov, 1968 : 383 (*Ruya*). Holotype ♀, NEW SOUTH WALES: Buraja (ANIC, Canberra). **Comb. n.** – N.S.W.
- westralica** Paramonov, 1968 : 382 (*Ruya*). Holotype ♂, WESTERN AUSTRALIA: Pinjaira (ANIC, Canberra). **Comb. n.** – W.A.

### Genus **SENOTOMA** Macquart

- Senostoma** Macquart, 1847 : 96 (80). Type-species: *Senostoma variegata* Macquart, 1847, by monotypy.
- Rhynchiodexia** Bigot, 1885a : xi. Type-species: *Rhynchiodexia tenuipes* Bigot, 1885, by monotypy. (NEW CALEDONIA). **Syn. n.**

- Austrodexia* Malloch, 1930a : 122. Type-species: *Austrodexia setigera* Malloch, 1930, by original designation. **Syn. n.**
- Lasiocalypter* Malloch, 1930a : 119. Type-species: *Lasiocalypter flavohirta* Malloch, 1930, by original designation. **Syn. n.**
- Lasiocalyptrina* Malloch, 1930a : 122. Type-species: *Lasiocalyptrina modesta* Malloch, 1930, by original designation. **Syn. n.**
- apicale** Curran, 1938 : 193 (*Lasiocalypter*). Holotype ♂, NEW SOUTH WALES: Jenolan caves (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- appendiculatum** Macquart, 1851 : 202 (229) (*Dexia*). Holotype ♂, 'TASMANIA' (MNHN, Paris) [examined]. **Comb. n.** – N.S.W., QLD, TASM. (?).
- punctum** Walker, 1858 : 205. Lectotype ♂ [not ♀] (by present designation), NEW SOUTH WALES (BMNH, London) [examined]. **Syn. n.**
- atripes** Malloch, 1930a : 121 (*Lasiocalypter*). Holotype ♂, NEW SOUTH WALES: Blue Mts (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- basale** Curran, 1938 : 193 (*Lasiocalypter*). Holotype ♂, QUEENSLAND: Macpherson Range, Roberts Plateau (SPHTM, Sydney) [examined]. **Comb. n.** – QLD.
- brevipalpe** Macquart, 1846 : 317 (189) (*Omalogaster*). Lectotype ♂ (by designation of Crosskey, 1971 : 280), TASMANIA (MNHN, Paris) [examined]. **Comb. n.** – TASM.
- brevipalpe** Rondani, 1864 : 22 (*Dexia*). Type(s), AUSTRALIA (not located, probably lost). **Comb. n.** – AUSTRALIA (state unknown).
- S. brevipalpe* Rondani is a junior secondary homonym of *S. brevipalpe* Macquart. No new name is proposed at the present time.
- commune** Malloch, 1930a : 125 (*Austrodexia*). Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Canberra (ANIC, Canberra) [examined]. **Comb. n.** – A.C.T., N.S.W., QLD.
- flavohirtum** Malloch, 1930a : 121 (*Lasiocalypter*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- hirticauda** Malloch, 1930a : 120 (*Lasiocalypter*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- hyria** Walker, 1849 : 843 (*Dexia*). Type(s), SOUTH AUSTRALIA: Adelaide (lost). **Comb. n.** – S.A.
- mixtum** Malloch, 1930a : 126 (*Austrodexia*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- modestum** Malloch, 1930a : 122 (*Lasiocalyptrina*). Holotype ♂, VICTORIA: Gisborne (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W., TASM., VICT.
- nigrihirtum** Malloch, 1930a : 119 (*Lasiocalypter*). Holotype ♂, NEW SOUTH WALES: Kosciusko [publ. as 'Barrington Tops'] (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W., VICT.
- notatum** Walker, 1852 : 309 (*Dexia*). Holotype ♀, NEW SOUTH WALES (BMNH, London) [examined]. **Comb. n.** – N.S.W., VICT.
- pallidihirtum** Malloch, 1930a : 126 (*Austrodexia*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- punctipenne** Macquart, 1846 : 315 (187) (*Dexia*). Holotype ♂, AUSTRALIA (BMNH, London) [examined]. **Comb. n.** – AUSTRALIA (state unknown).
- pictipennis**. Incorrect subsequent spelling (lapsus for *punctipennis* by Malloch, 1930a : 123). Malloch (1930a : 124) reports this species from N.S.W. and W.A. but his identification (as '*pictipennis*') needs confirmation.
- rubricarinatum** Macquart, 1846 : 315 (187) (*Dexia*). Holotype ♂, TASMANIA (MNHN, Paris) [examined]. **Comb. n.** – TASM.
- setigerum** Malloch, 1930a : 124 (*Austrodexia*). Holotype ♂, NEW SOUTH WALES: Woy Woy (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W., QLD.
- setiventre** Malloch, 1930a : 126 (*Austrodexia*). Holotype ♂, NEW SOUTH WALES: Glenreagh (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W., QLD.
- taylori** Curran, 1938 : 191 (*Austrodexia*). Holotype ♀, QUEENSLAND: Kuranda (SPHTM, Sydney) [examined]. **Comb. n.** – QLD.

- tessellatum** Macquart, 1851 : 202 (229) (*Dexia*). Holotype ♀, 'TASMANIA' (MNHN, Paris) [examined]. **Comb. n.** – TASM. (?).
- testaceicorne** Macquart, 1851 : 201 (228) (*Dexia*). Holotype ♂, TASMANIA [publ. as 'Oceania'] (MNHN, Paris) [examined]. **Comb. n.** – TASM.
- unipunctum** Malloch, 1930a : 126 (*Austrodexia*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.
- variegatum** Macquart, 1847 : 96 (80) (as *variegata*). Holotype ♀, TASMANIA (BMNH, London) [examined]. – N.S.W., TASM.

### Genus *TRICHOSTYLUM* Macquart

- Trichostylum* Macquart, 1851 : 181 (208). Type-species: *Trichostylum rufipalpis* Macquart, 1851, by monotypy.
- rufipalpe** Macquart, 1851 : 182 (209) (as *rufipalpis*). Holotype ♀, AUSTRALIA (MNHN, Paris) [examined]. – AUSTRALIA (state unknown; publ. as 'côte orientale', prob. N.S.W. or QLD).

### Tribe RUTILIINI Brauer & Bergenstamm

- RUTILIIDAE Brauer & Bergenstamm, 1889 : 76, 152. Type-genus: *Rutilia* Robineau-Desvoidy, 1830.

### Genus *AMPHIBOLIA* Macquart

- Amphibolia* Macquart, 1843 : 278 (121). Type-species: *Amphibolia valentina* Macquart, 1843, by original designation.

#### Subgenus *AMPHIBOLIA* Macquart

- Amphibolia* Macquart, 1843 : 278 (121). Type-species: *Amphibolia valentina* Macquart, 1843, by original designation.
- albocincta** Malloch, 1930a : 108 (*Rutilia*). Holotype ♀, NEW SOUTH WALES: Barrington Tops (ANIC, Canberra) [examined]. – A.C.T., N.S.W.
- campbelli** Paramonov, 1950 : 523. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Blundell's (ANIC, Canberra) [examined]. – A.C.T., N.S.W., VICT.
- communi** Paramonov, 1968 : 363. Holotype ♀, VICTORIA: Grampians, Fyan's Creek (ANIC, Canberra). – N.S.W., VICT.
- ignorata** Paramonov, 1950 : 522. Holotype ♂, NEW SOUTH WALES: Tindery (ANIC, Canberra) [examined]. – A.C.T., N.S.W., S.A., VICT., W.A.; LORD HOWE I.
- valentina** Macquart, 1843 : 279 (122). Type(s) ♂, AUSTRALIA (MHN, Lille). – N.S.W., QLD., TASM., VICT., W.A.
- vidua* Guérin-Méneville, 1843 : 273 (*Rutilia*). Syntypes (1 ♂, 3 ♀), AUSTRALIA (lost).
- wilsoni** Paramonov, 1950 : 524. Holotype ♂, VICTORIA: Warburton (NMV, Melbourne). – VICT.

#### Subgenus *PARAMPHIBOLIA* Brauer & Bergenstamm

- Paramphibolia* Brauer & Bergenstamm, 1891 : 389 (85) (as genus). Type-species: *Rutilia assimilis* Macquart, 1851, by monotypy.
- Chaetogastrina* Malloch, 1929b : 313. Type-species: *Chaetogastrina stolidi* Malloch, 1929, by original designation.
- assimilis** Macquart, 1851 : 192 (219) (*Rutilia*). Lectotype ♂ (by designation of Crosskey, 1971 : 285), TASMANIA (MNHN, Paris) [examined]. – TASM., VICT.
- stolidi** Malloch, 1929b : 313 (*Chaetogastrina*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (AM, Sydney) [examined]. – N.S.W.

Genus **CHETOASTER** Macquart

- Chetogaster* Macquart, 1851 : 198 (225). Type-species: *Chetogaster violacea* Macquart, 1851, by monotypy.
- Codium* Enderlein, 1936 : 417. Type-species: *Rutilia oblonga* Macquart sensu Enderlein (misidentification) [= *Chetogaster violacea* Macquart], by original designation.
- Chaetogaster*. Incorrect subsequent spelling of *Chetogaster* Macquart.
- argentifera* Malloch, 1936 : 19. Holotype ♀, VICTORIA: Gisborne (SPHTM, Sydney) [examined]. – A.C.T., N.S.W., VICT.
- auriceps* Paramonov, 1968 : 371. Holotype ♀, QUEENSLAND: Collinsville (ANIC, Canberra). – QLD.
- canberrae* Paramonov, 1954 : 277. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Black Mt (ANIC, Canberra) [examined]. – A.C.T., N.S.W., QLD, VICT.
- oblonga* Macquart, 1847 : 92 (76) (*Rutilia*). Holotype ♂, AUSTRALIA (BMNH, London, [examined]). – N.S.W., VICT.
- gratiosa* Paramonov, 1954 : 283. Holotype ♂, VICTORIA: Gibraltar Point, Wonnangatta River (ANIC, Canberra) [examined].
- pellucida* Paramonov, 1954 : 276 (as var. of *argentifera*). Holotype ♂, NEW SOUTH WALES: Toronto (ANIC, Canberra) [examined]. – N.S.W.
- violacea* Macquart, 1851 : 198 (225). Holotype ♂, AUSTRALIA (MNHN, Paris) [examined]. – A.C.T., N.S.W., QLD, VICT.
- [*oblonga* Macquart sensu Enderlein (misidentification)]
- viridis* Malloch, 1936 : 19. Holotype ♂, NEW SOUTH WALES: Comboyne (SPHTM, Sydney) [examined]. – N.S.W., QLD.

Genus **CHRYSTOPASTA** Brauer & Bergenstamm

- Chrysopasta* Brauer & Bergenstamm, 1889 : 152 (84). Type-species: *Chrysopasta versicolor* Brauer & Bergenstamm, 1889 [= *Rutilia elegans* Macquart, 1846], by original designation and monotypy.
- Roederia* Brauer & Bergenstamm, 1893 : 98 (10). Type-species: *Chrysopasta versicolor* Brauer & Bergenstamm, 1889 [= *Rutilia elegans* Macquart, 1846], by monotypy (see Crosskey, 1973 : 103). [Junior homonym of *Roederia* Mik, 1881.]
- Echrysopasta* Townsend, 1932 : 39. Type-species: *Rutilia elegans* Macquart, 1846, by original designation.
- Euchrysopasta*. Incorrect subsequent spelling of *Echrysopasta* Townsend (Paramonov, 1968).
- elegans* Macquart, 1846 : 309 (181) (*Rutilia*). Holotype ♂, [WESTERN AUSTRALIA] (BMNH, London) [examined]. – W.A.
- Type-locality originally cited as Sydney, New South Wales, in error (Crosskey, 1973 : 106).
- zabirna* Walker, 1849 : 863 (*Dexia*). Lectotype ♂ (by designation of Crosskey, 1973 : 118), WESTERN AUSTRALIA: Perth (BMNH, London) [examined].
- versicolor* Brauer & Bergenstamm, 1889 : 171 (103). Lectotype ♂ (by fixation of Malloch, 1928a : 616), WESTERN AUSTRALIA: Swan River (NM, Vienna).
- zabrina*. Incorrect subsequent spelling of *zabirna* Walker.

Genus **FORMOSIA** Guérin-Méneville

- Formosia* Guérin-Méneville, 1843 : 263. Type-species: *Rutilia mirabilis* Guérin-Méneville, 1831, by monotypy. (NEW GUINEA).

Subgenus **EUAMPHIBOLIA** Townsend

- Euamphibolia* Townsend, 1916b : 618 (as genus). Type-species: *Rutilia fulvipes* Guérin-Méneville, 1843 [= *Rutilia speciosa* Erichson, 1842], by original designation.

- Hega* Enderlein, 1936 : 419, 421. Type-species: *Hega viridicingens* Enderlein, 1936 [= *Rutilia complicita* Walker, 1861], by original designation. (MOLUCCAS).
- faceta* Enderlein, 1936 : 422 (*Hega*). Holotype ♂, QUEENSLAND: North Queensland (MNHU, Berlin) [examined]. – QLD.
- smaragdina* Malloch, 1929b : 312. Holotype ♀, QUEENSLAND: Gordonvale (AM, Sydney) [examined]. – QLD.
- speciosa* Erichson, 1842 : 273 (*Rutilia*). Lectotype ♀ (by designation of Crosskey, 1973 : 120), TASMANIA (MNHU, Berlin) [examined]. – A.C.T., N.S.W., QLD, TASM., VICT., W.A.
- fulvipes* Guérin-Méneville, 1843 : 273 (*Rutilia*). Holotype ♀, AUSTRALIA (lost).

### Genus *PRODIAPHANIA* Townsend

- Diaphania* Macquart, 1843 : 277 (120). Type-species: *Diaphania testacea* Macquart, 1843, by monotypy. [Junior homonym of *Diaphania* Hübner, 1818.]
- Prodiaphania* Townsend, 1927b : 159. [Replacement name for *Diaphania* Macquart.] [Senostoma Macquart sensu authors (misidentification)]
- arida* Paramonov, 1968 : 397. Holotype ♂, VICTORIA: Little Desert, 5 mls S. of Kiata (ANIC, Canberra). – VICT.
- biarmata* Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, SOUTH AUSTRALIA (SPHTM, Sydney) [examined]. – S.A.
- brevitarsis* Paramonov, 1968 : 395. Holotype ♂, NEW SOUTH WALES: near Queanbeyan (ANIC, Canberra). – N.S.W.
- claripennis* Malloch, 1929b : 292 (as var. of *testacea*). Holotype ♂, WESTERN AUSTRALIA: King George's Sound (AM, Sydney) [examined]. – W.A.
- commoni* Paramonov, 1968 : 389. Holotype ♂, VICTORIA: Little Desert, 5 mls S. of Kiata (ANIC, Canberra). – S.A., VICT.
- cygnus* Malloch, 1936 : 15 (*Senostoma*). Holotype ♂, WESTERN AUSTRALIA: Swan River (SPHTM, Sydney) [examined]. – W.A.
- deserta* Paramonov, 1968 : 398. Holotype ♂, NEW SOUTH WALES: Wanaaring (ANIC, Canberra). – N.S.W., QLD.
- echinomides* Bigot, 1874 : 466 (*Rutilia*). Holotype ♀, AUSTRALIA (BMNH, London) [examined]. – AUSTRALIA (state unknown).
- echinomyidea*. Incorrect subsequent spelling of *echinomides* Bigot (Brauer, 1899 : 512).
- fullerae* Paramonov, 1968 : 393. Holotype ♂, NEW SOUTH WALES: Barrington Tops (ANIC, Canberra). – N.S.W.
- funebria* Paramonov, 1968 : 391. Holotype ♂, SOUTH AUSTRALIA: 40 mls SW of Iron Knob (ANIC, Canberra). – S.A., W.A.
- furcata* Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Canberra (ANIC, Canberra) [examined]. – A.C.T., N.S.W., S.A., VICT.
- genitalis* Paramonov, 1968 : 400. Holotype ♂, QUEENSLAND: Herberton (BMNH, London) [examined]. – A.C.T., N.S.W., QLD, VICT.
- paratestacea* Paramonov, 1968 : 397. Holotype ♂, NEW SOUTH WALES: Wee Jasper (ANIC, Canberra).
- georgei* Malloch, 1929b : 292. Holotype ♂, WESTERN AUSTRALIA: King George's Sound (AM, Sydney) [examined]. – N.S.W., S.A., W.A.
- minuta* Paramonov, 1968 : 399. Holotype ♂, QUEENSLAND: Gordonvale (ANIC, Canberra). – QLD.
- regina* Malloch, 1936 : 14 (*Senostoma*). Holotype ♂, QUEENSLAND: Eidsvold (SPHTM, Sydney) [examined]. – QLD.
- testacea* Macquart, 1843 : 278 (121) (*Diaphania*). Type(s), AUSTRALIA (MHN, Lille). – A.C.T., N.S.W., QLD, TASM.
- victoriae* Malloch, 1936 : 13 (*Senostoma*). Holotype ♂, VICTORIA: Gisborne (SPHTM, Sydney) [examined]. – N.S.W., QLD, VICT.

- vittata** Macquart, 1855 : 126 (106) (*Rutilia*). Holotype ♀, SOUTH AUSTRALIA: Adelaide (BMNH, London) [examined]. – S.A., TASM. (?). (Probably = *testacea* ♀).
- walkeri** Paramonov, 1968 : 400. Holotype ♀, WESTERN AUSTRALIA (AMNH, New York). – W.A.

### Genus *RUTILIA* Robineau-Desvoidy

*Rutilia* Robineau-Desvoidy, 1830 : 319. Type-species: *Tachina vivipara* Fabricius, 1805, by subsequent designation of Crosskey (1967a : 26).

#### Subgenus *AMENIAMIMA* Crosskey

- Ameniamima* Crosskey, 1973 : 51. Type-species: *Rutilia argentifera* Bigot, 1874, by original designation.
- argentifera** Bigot, 1874 : 464. Lectotype ♂ (by designation of Crosskey, 1971 : 300), NEW SOUTH WALES: Sydney (BMNH, London) [examined]. – N.S.W., QLD.
- frontosa** Brauer & Bergenstamm, 1891 : 418 (114). *Nomen nudum*.
- frontosa** Malloch, 1929b : 310 (*Formosia*). Holotype ♂, NEW SOUTH WALES: Jindabyne (AM, Sydney) [examined].
- cingulata** Malloch, 1930a : 105 (*Formosia*). Holotype ♂, NEW SOUTH WALES: Wentworth Falls (ANIC, Canberra) [examined]. – N.S.W.
- quadripunctata** Malloch, 1930a : 104 (*Formosia*). Holotype ♂, QUEENSLAND: Eidsvold (ANIC, Canberra) [examined]. – QLD, VICT.

#### Subgenus *CHRYSORUTILIA* Townsend

- Chrysorutilia* Townsend, 1915b : 23 (as genus). Type-species: *Rutilia formosa* Robineau-Desvoidy, 1830, by original designation.
- Habrota** Enderlein, 1936 : 399. Type-species: *Rutilia formosa* Robineau-Desvoidy, 1830, by original designation. [Objective synonym of *Chrysorutilia*.]
- Zoramisceus** Enderlein, 1936 : 416. Type-species: *Rutilia erichsonii* Engel, 1925 [= *Dexia chersipho* Walker, 1849], by original designation.
- caeruleata** Enderlein, 1936 : 402 (*Chrysorutilia*). Lectotype ♂ (by designation of Crosskey, 1973 : 117), WESTERN AUSTRALIA: Marloo Station (MNHU, Berlin) [examined]. – W.A.
- lineata** Enderlein, 1936 : 407 (*Chrysorutilia*). Lectotype ♂ (by designation of Crosskey, 1973 : 118), WESTERN AUSTRALIA: Wurarga, Marloo Station (MNHU, Berlin) [examined].
- caesia** Enderlein, 1936 : 402 (*Chrysorutilia*). Lectotype ♂ (by designation of Crosskey, 1973 : 117), AUSTRALIA (MNHU, Berlin) [examined]. – N.T., QLD, W.A.
- viridescens** Enderlein, 1936 : 403 (*Chrysorutilia*, as var. of *caesia*). Holotype ♀, QUEENSLAND (MNHU, Berlin) [examined].
- rufibarbis** Enderlein, 1936 : 405 (*Chrysorutilia*). Lectotype ♂ (by designation of Crosskey, 1973 : 118), WESTERN AUSTRALIA: Wurarga, Marloo Station (MNHU, Berlin) [examined].
- chersipho** Walker, 1849 : 864 (*Dexia*). Neotype ♂ (by designation of Crosskey, 1973 : 123), WESTERN AUSTRALIA: Waroona (BMNH, London) [examined]. – W.A.
- erichsonii** Brauer & Bergenstamm, 1891 : 418 (114). *Nomen nudum*.
- erichsonii** Engel, 1925 : 363. Lectotype ♀ (by fixation of Malloch, 1929b : 297), WESTERN AUSTRALIA: Swan River (NM, Vienna) [examined].
- erichsoni**. Incorrect subsequent spelling of *erichsonii* Brauer & Bergenstamm.
- corona** Curran, 1930 : 3. Holotype ♂, NEW SOUTH WALES (AMNH, New York) [examined]. – N.S.W.

- cryptica** Crosskey, 1973 : 65. Holotype ♂, SOUTH AUSTRALIA: near Moonta (BMNH, London) [examined]. – N.S.W., S.A., VICT.
- decora** Guérin-Méneville, 1843 : 266. Neotype ♂ (by designation of Crosskey, 1973 : 124), QUEENSLAND: Burpengary (BMNH, London) [examined]. – N.S.W., QLD, TASM.
- formosa** Robineau-Desvoidy, 1830 : 320. Neotype ♂ (by designation of Crosskey, 1973 : 124), NEW SOUTH WALES: near Lake George (ANIC, Canberra) [examined]. – A.C.T., N.S.W., VICT., W.A. (?).
- uzita** Walker, 1849 : 860 (*Dexia*). Holotype ♀, AUSTRALIA (BMNH, London) [examined].
- pubicollis** Thomson, 1869 : 530. Lectotype ♂ (by designation of Crosskey, 1973 : 120), NEW SOUTH WALES: Sydney (NR, Stockholm) [examined].
- subvittata** Malloch, 1929b : 295 (as var. of *formosa*). Holotype ♀, WESTERN AUSTRALIA: King George's Sound (AM, Sydney) [examined].
- There is some doubt about the placement of this name: the type was seen in 1965 but was not available during a recent revision of *Rutiliini* (Crosskey, 1973).
- goerlingiana** Enderlein, 1936 : 404 (*Chrysorutilia*). Lectotype ♀ (by designation of Crosskey, 1973 : 117), WESTERN AUSTRALIA: Wurarga, Marloo Station (MNHU, Berlin) [examined]. – W.A.
- idesa** Walker, 1849 : 858 (*Dexia*). Holotype ♂ [not ♀], AUSTRALIA (BMNH, London) [examined]. – AUSTRALIA (state unknown).
- imperialis** Guérin-Méneville, 1843 : 265. Neotype ♂ (by designation of Crosskey, 1973 : 125), NEW SOUTH WALES: Mount Wilson (ANIC, Canberra) [examined]. – N.S.W., QLD, VICT.
- ruficornis** Bigot, 1880 : 88. Holotype ♂, AUSTRALIA (BMNH, London) [examined].
- semifulva** Bigot, 1880 : 89. Lectotype ♂ (by designation of Crosskey, 1971 : 301), AUSTRALIA (BMNH, London) [examined].
- imperialoides** Crosskey, 1973 : 67. Holotype ♂, NEW SOUTH WALES: Wee Jasper (BMNH, London) [examined]. – A.C.T., N.S.W., QLD, VICT.
- panthea** Walker, 1849 : 862 (*Dexia*). Holotype ♀, WESTERN AUSTRALIA (BMNH, London) [examined]. – S.A., W.A.
- rubriceps** Macquart, 1847 : 92 (76). Holotype ♀, 'TASMANIA' (BMNH, London) [examined]. – QLD, TASM. (?); CEYLON, INDIA, VIETNAM, TIMOR (?).
- serena** Walker, 1849 : 865 (*Dexia*). Neotype ♀ (by designation of Crosskey, 1973 : 123), INDIA: Maharashtra, Purandhar, near Poona (BMNH, London) [examined].
- nitens** Macquart, 1851 : 189 (216). Holotype ♀, INDIA (MNH, Paris) [examined].
- formosina** Curran, 1930 : 2. Holotype ♂, AUSTRALIA (AMNH, New York) [examined].
- angustigena** Enderlein, 1936 : 403 (*Chrysorutilia*). Lectotype ♂ (by designation of Crosskey, 1973 : 117), QUEENSLAND: Herberton (MNHU, Berlin) [examined].
- splendida** Donovan, 1805 : plate fig. (unnumbered) & description (unpaginated) (*Musca*). Neotype ♂ (by designation of Crosskey, 1973 : 123), QUEENSLAND: Brisbane (BMNH, London) [examined]. – N.S.W., QLD, VICT.
- australasia** Gray in Cuvier, 1832 : 793 & Plate 114, fig. 1. Type(s), AUSTRALIA (lost).
- confluens** Enderlein, 1936 : 407 (*Chrysorutilia*, as var. of *splendida*). Lectotype ♂ (by designation of Crosskey, 1973 : 118), QUEENSLAND (MNHU, Berlin) [examined].
- evanescens** Enderlein, 1936 : 407 (*Chrysorutilia*, as var. of *splendida*). Holotype ♂, AUSTRALIA (MNHU, Berlin) [examined].
- transversa** Malloch, 1936 : 15. Holotype ♂, WESTERN AUSTRALIA: Swan River (SPHTM, Sydney) [examined]. – W.A.

#### Subgenus **DONOVANIUS** Enderlein

- Donovanius* Enderlein, 1936 : 409 (as genus). Type-species: *Musca regalis* Guérin-Méneville, 1843, by original designation.
- Psaronia* Enderlein, 1936 : 414. Type-species: *Psaronia bisetosa* Enderlein, 1936, by original designation.

- Menevillea* Enderlein, 1936 : 416. Type-species: *Rutulia pellucens* Macquart, 1846, by original designation.
- agalmiodes* Enderlein, 1936 : 412 (*Donovanius*). Holotype ♂, QUEENSLAND: Cairns (MNHU, Berlin) [examined]. – QLD.
- analoga* Macquart, 1851 : 191 (218). Holotype ♀ [not ♂], 'TASMANIA' (MNHN, Paris) [examined]. – A.C.T., N.S.W., QLD, TASM. (?), VICT.
- dubitata* Malloch, 1929b : 303. Holotype ♀, NEW SOUTH WALES: Jindabyne (AM, Sydney) [examined].
- bisetosa* Enderlein, 1936 : 414 (*Psaronia*). Lectotype ♀ (by designation of Crosskey, 1973 : 119), WESTERN AUSTRALIA: Wurarga, Marloo Station (MNHU, Berlin) [examined]. – W.A.
- nigribasis* Enderlein, 1936 : 411 (*Donovanius*, as var. of *fulgidus*). Lectotype ♂ (by designation of Crosskey, 1973 : 118), WESTERN AUSTRALIA: Wurarga, Marloo Station (MNHU, Berlin) [examined].
- ethoda* Walker, 1849 : 856 (*Dexia*). Holotype ♀, WESTERN AUSTRALIA: Swan River (BMNH, London) [examined]. – W.A.
- inusta* Wiedemann, 1851 : 306 (*Tachina*). Lectotype ♀ (by designation of Crosskey, 1973 : 121) NEW SOUTH WALES: Port Jackson (=Sydney) (MNHU, Berlin) [examined]. – A.C.T., N.S.W., QLD, S.A., TASM., VICT., W.A. (?).
- potina* Walker, 1849 : 857 (*Dexia*). Holotype ♀, TASMANIA (BMNH, London) [examined].
- spinipectus* Thomson, 1869 : 530. Lectotype ♂ (by designation of Crosskey, 1973 : 120), NEW SOUTH WALES: Sydney (NR, Stockholm) [examined].
- castanipes* Bigot, 1880 : 87. Lectotype ♀ (by designation of Crosskey, 1971 : 300), AUSTRALIA (BMNH, London) [examined].
- castanifrons* Bigot, 1880 : 88. Holotype ♀, AUSTRALIA (BMNH, London) [examined].
- lepida* Guérin-Ménéville, 1843 : 268. Neotype ♂ (by designation of Crosskey, 1973 : 125), AUSTRALIAN CAPITAL TERRITORY: Blundell's (ANIC, Canberra) [examined]. – A.C.T., N.S.W., VICT.
- fulgida* Macquart, 1846 : 308 (180). Lectotype ♂ (by designation of Crosskey, 1971 : 286), NEW SOUTH WALES: Sydney (BMNH, London) [examined].
- onoba* Walker, 1849 : 859 (*Dexia*). Holotype ♂, AUSTRALIA (BMNH, London) [examined].
- pellucens* Macquart, 1846 : 305 (177). Neotype ♂ (by designation of Crosskey, 1973 : 126), NEW SOUTH WALES: Durras Bay (BMNH, London) [examined]. – A.C.T., N.S.W., VICT.
- imitator* Enderlein, 1936 : 412 (*Donovanius*). Holotype ♂, AUSTRALIA (MNHU, Berlin) [examined].
- regalis* Guérin-Ménéville, 1831 : Plate 21, fig. 1, 1A–E; 1838 : 295. Neotype ♂ (by designation of Crosskey, 1973 : 126), AUSTRALIAN CAPITAL TERRITORY: Tharwa (ANIC, Canberra) [examined]. – A.C.T., N.S.W., S.A., VICT.
- nigra* Macquart, 1846 : 305 (177). *Nomen nudum*.
- retusa* Fabricius, 1775 : 775 (*Musca*). Holotype ♀, AUSTRALIA (BMNH, London: Banks Coll.) [examined]. – W.A. (Type-locality unknown, probably not W.A.).
- aditha* Walker, 1849 : 854 (*Dexia*). Lectotype ♂ (by present designation), WESTERN AUSTRALIA: Swan River (BMNH, London) [examined].
- viriditestacea* Macquart, 1851 : 190 (217). Lectotype ♂ (by designation of Crosskey, 1971 : 290), 'TASMANIA' (MNHN, Paris) [examined].
- sabrata* Walker, 1849 : 855 (*Dexia*). Holotype ♀, AUSTRALIA (BMNH, London) [examined]. – N.S.W., QLD.
- [*inornata* Guérin-Ménéville sensu Malloch (misidentification)]
- spinolae* Rondani, 1864 : 23. Type(s), AUSTRALIA (not located, probably lost).
- viridinigra* Macquart, 1846 : 307 (179). Lectotype ♀ (by designation of Crosskey, 1971 : 290), 'TASMANIA' (MNHN, Paris) [examined]. – N.S.W., QLD, TASM. (?).
- fuscotestacea* Macquart, 1846 : 306 (178). Holotype ♀, NEW SOUTH WALES: Sydney (BMNH, London) [examined].
- barcha* Walker, 1849 : 857 (*Dexia*). Holotype ♀, AUSTRALIA (BMNH, London) [examined].

Subgenus **GRAPHOLOSTYLUM** Macquart

- Grapholostylum* Macquart, 1851 : 196 (223) (as genus). Type-species: *Grapholostylum dorso-maculatum* Macquart, 1851, by monotypy.
- Agalmia* Enderlein, 1936 : 433. Type-species: *Rutilia albopicta* Thomson, 1869 [= *Grapholostylum dorsomaculatum* Macquart, 1851], by original designation. [[junior homonym of *Agalmia* Enderlein, 1934 (Muscidae)].]
- albovirida** Malloch, 1929b : 307. Holotype ♀, QUEENSLAND: Yeppoon (AM, Sydney) [examined]. – QLD.
- dorsomaculata** Macquart, 1851 : 196 (223) (*Grapholostylum*). Lectotype ♂ (by designation of Crosskey, 1971 : 271), 'TASMANIA' (MNH, Paris) [examined]. – N.S.W., TASM. (?).
- leucosticta* Schiner, 1868 : 319. Holotype ♀, [AUSTRALIA: publ. as New Zealand in error] (NM, Vienna) [examined].
- albopicta* Thomson, 1869 : 529. Holotype ♀, NEW SOUTH WALES: Sydney (NR, Stockholm) [examined].
- variegata* Bigot, 1874 : 461 (*Formosia*). Lectotype ♀ (by designation of Crosskey, 1971 : 299), AUSTRALIA (BMNH, London) [examined].
- fuscesquama* Malloch, 1930a : 107 (as var. of *leucosticta*). Holotype ♀, NEW SOUTH WALES: Barrington Tops (ANIC, Canberra) [examined].
- micans** Malloch, 1929b : 299. Holotype ♀, NEW SOUTH WALES: Kosciusko (AM, Sydney) [examined]. – A.C.T., N.S.W.
- subtomentosa** Macquart, 1851 : 191 (218). Holotype ♂, TASMANIA (MNH, Paris) [examined]. – TASM.
- velutina* Bigot, 1874 : 463 (*Formosia*). Lectotype ♀ (by designation of Crosskey, 1971 : 299), TASMANIA (BMNH, London) [examined].

Subgenus **MICRORUTILIA** Townsend

- Microrutilia* Townsend, 1915b : 23 (as genus). Type-species: *Rutilia minor* Macquart, 1846, by original designation.
- Prosenostoma* Townsend, 1932 : 39. Type-species: *Senostoma flavipes* Brauer & Bergenstamm sensu Townsend (misidentification) [= *Rutilia (Senostoma) hirticeps* Malloch, 1929], by original designation.
- Eucompsa* Enderlein, 1936 : 400. Type-species: *Rutilia minor* Macquart, 1846, by original designation. [[junior homonym of *Eucompsa* Enderlein, 1922 (Tabanidae) and junior objective synonym of *Microrutilia* Townsend.]]
- Pogonagalmia* Enderlein, 1936 : 435. Type-species: *Rutilia (Senostoma) hirticeps* Malloch, 1929, by original designation. [[junior objective synonym of *Prosenostoma* Townsend.]] [*Senostoma* Macquart sensu authors (misidentification)]
- agalmiodes* Enderlein, 1936 : 434 (*Prosenostoma*, as aberration of *ruficorne*). Aberrational name without status in nomenclature.
- cupreiventris** Malloch, 1936 : 18 (as var. of *ruficornis*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (SPHTM, Sydney) [examined]. – N.S.W.
- fulviventris** Bigot, 1874 : 465. Lectotype ♀ (by designation of Crosskey, 1971 : 301), TASMANIA (BMNH, London) [examined]. – TASM.
- flavipes* Brauer & Bergenstamm, 1889 : 126 (58) (*Senostoma*). Lectotype ♀ (by designation of Crosskey, 1973 : 121), AUSTRALIA (NM, Vienna) [examined].
- hirticeps** Malloch, 1929b : 305. Holotype ♂, NEW SOUTH WALES: Monaro, Moonbar (AM, Sydney) [examined]. – N.S.W., VICT., W.A.
- pallens* Curran, 1930 : 2. Holotype ♂, NEW SOUTH WALES (AMNH, New York) [examined]. [*flavipes* Brauer & Bergenstamm sensu Townsend (misidentification)]
- liris** Walker, 1849 : 882 (*Musca*). Holotype ♀ [AUSTRALIA, prob. TASMANIA] (BMNH, London) [examined]. – TASM. (Probably = *minor* ♀).
- livis*. Incorrect subsequent spelling of *liris* Walker (Malloch, 1928b : 660).

- media** Macquart, 1846 : 310 (182). Lectotype ♂ (by designation of Crosskey, 1971 : 286), TASMANIA (MNHN, Paris) [examined]. – N.S.W., TASM., VICT.  
**ruficornis** Macquart, 1851 : 193 (220) (*Diaphania*). Holotype ♂, TASMANIA (MNHN, Paris) [examined].  
**minor** Macquart, 1846 : 310 (182). Lectotype ♂ (by designation of Crosskey, 1971 : 286), TASMANIA (MNHN, Paris) [examined]. – TASM., N.S.W.  
**nigriceps** Malloch, 1929b : 306. Holotype ♂, NEW SOUTH WALES, East Dorrigo, Ulong (AM, Sydney) [examined]. – N.S.W.  
**nigripes** Enderlein, 1936 : 435 (*Prosenostoma*). Lectotype ♂ (by designation of Crosskey, 1973 : 119), QUEENSLAND: Herberton (MNHU, Berlin) [examined]. – A.C.T., QLD.

#### Subgenus **NEORUTILIA** Malloch

- Neorutilia** Malloch, 1936 : 17. Type-species: *Rutilia* (*Neorutilia*) *simplex* Malloch, 1936, by original designation.  
**simplex** Malloch, 1936 : 17. Holotype ♂, QUEENSLAND: Eidsvold (SPHTM, Sydney) [examined]. – N.S.W., QLD, VICT.

#### Subgenus **RUTILIA** Robineau-Desvoidy

- Rutilia** Robineau-Desvoidy, 1830 : 319 (as genus). Type-species: *Tachina vivipara* Fabricius 1805, by subsequent designation of Crosskey (1967a : 26).  
**Psaroniella** Enderlein, 1936 : 417. Type-species: *Rutilia castanipes* Bigot sensu Enderlein (misidentification) [= *Rutilia setosa* Macquart, 1847], by original designation.  
**Stiraulax** Enderlein, 1936 : 428. Type-species: *Tachina vivipara* Fabricius, 1805, by original designation. [Junior objective synonym of *Rutilia*.]  
**confusa** Malloch, 1929b : 309 (*Formosia*). Holotype ♂, SOUTH AUSTRALIA: Kangaroo Island, deep creek 20 mls from Kingscote (AM, Sydney) [examined]. – A.C.T., N.S.W., S.A., VICT.  
**dentata** Crosskey, 1973 : 81. Holotype ♂, VICTORIA: Monbulk (BMNH, London) [examined]. – VICT.  
**setosa** Macquart, 1847 : 94 (78). Neotype ♂ (by designation of Crosskey, 1973 : 126), NEW SOUTH WALES: 4 mls N. of Bateman's Bay (ANIC, Canberra) [examined]. – N.S.W., VICT. [*castanipes* Bigot sensu Enderlein (misidentification)]  
**vivipara** Fabricius, 1805 : 309 (*Tachina*). Neotype ♂ (by designation of Crosskey, 1973 : 126), NEW SOUTH WALES: Barrington Tops (ANIC, Canberra) [examined]. – A.C.T., N.S.W., QLD, TASM., VICT.  
**durvillei** Robineau-Desvoidy, 1830 : 321. Neotype ♂ (by designation of Crosskey, 1973 : 124), NEW SOUTH WALES: Hawkesbury River (BMNH, London) [examined].  
**inornata** Guérin-Méneville, 1843 : 268. Lectotype ♀ (by designation of Crosskey, 1973 : 119), AUSTRALIA (MNHN, Paris) [examined].  
**desvoidyi** Guérin-Méneville, 1843 : 269. Lectotype ♀ (by designation of Crosskey, 1973 : 119), AUSTRALIA (MNHN, Paris) [examined].

#### Subgenerically unplaced species of *Rutilia* s.l.

- micropalpis** Malloch, 1929b : 298. Holotype ♀, NEW SOUTH WALES: Como (AM, Sydney). – N.S.W.  
**scutellata** Enderlein, 1936 : 405 (*Chrysorutilia*, as var. of *media*). Holotype ♀, SOUTH AUSTRALIA: Adelaide (MNHU, Berlin). – S.A. (Status uncertain)

#### Unplaced names of Rutiliini

- accedens** Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum*.  
**accedens** Brauer, 1899 : 512 (*Rutilia*). Unavailable.

- erronea* Paramonov, 1968 : 356, 361 (*Rutilia*). *Nomen nudum*.  
*grisea* Brauer & Bergenstamm, 1891 : 417 (113) (*Diaphania*). *Nomen nudum*.  
*humeralis* Paramonov, 1968 : 355 (*Rutilia*). *Nomen nudum*.  
*incomparabilis* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum*.  
*soror* Brauer & Bergenstamm, 1891 : 418 (114) (*Rutilia*). *Nomen nudum*.  
*viridithorax* Bigot, 1874 : 457 (*Formosia*). *Nomen nudum*.

### Subfamily TACHININAE Robineau-Desvoidy

TACHINARIAE Robineau-Desvoidy, 1830 : 185. Type-genus: *Tachina* Meigen, 1803.

### Tribe PALPOSTOMATINI Townsend

PALPOSTOMATINI Townsend, 1925 : 250. Type-genus: *Palpostoma* Robineau-Desvoidy, 1830.

### Genus APALPOSTOMA Malloch

- Apalpostoma* Malloch, 1930a : 134. Type-species: *Apalpostoma cinerea* Malloch, 1930, by original designation.  
*cinereum* Malloch, 1930a : 134 (as *cinerea*). Holotype ♀, WESTERN AUSTRALIA: Wyalkatchem (SPHTM, Sydney) [examined]. – W.A.

### Genus EUSTACOMYIA Malloch

- Eustacomyia* Malloch, 1927 : 337. Type-species: *Eustacomyia breviseta* Malloch, 1927, by original designation.  
*breviseta* Malloch, 1927 : 337. Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.  
*hirta* Malloch, 1930a : 133. Holotype ♂, NEW SOUTH WALES: Killara, Allowrie (SPHTM, Sydney) [examined]. – N.S.W.

### Genus PALPOSTOMA Robineau-Desvoidy

- Palpostoma* Robineau-Desvoidy, 1830 : 429. Type-species: *Palpostoma testacea* Robineau-Desvoidy, 1830, by monotypy.  
*Opsophasisops* Townsend, 1915b : 22. Type-species: *Myiophasia flava* Coquillett, 1900, by original designation.  
*Pseudopalpostoma* Townsend, 1926c : 533. Type-species: *Palpostoma desvoidyi* Aldrich, 1922, by original designation.  
*aldrichi* Hardy, 1938 : 57. Lectotype ♂ (by present designation), QUEENSLAND: Cairns (USNM, Washington) [examined]. – QLD.  
 [*testacea* Robineau-Desvoidy sensu Aldrich (misidentification)]  
*apicale* Malloch, 1927 : 339 (as *apicalis*). Holotype ♀, NEW SOUTH WALES: Woy Woy (SPHTM, Sydney) [examined]. – N.S.W.  
*armiceps* Malloch, 1931 : 296. Holotype ♀, QUEENSLAND: Townsville (USNM, Washington) [examined]. – QLD.  
*desvoidyi* Aldrich, 1922 : 5. Holotype ♂, QUEENSLAND: Cairns (USNM, Washington) [examined]. – A.C.T., QLD.

**flavum** Coquillett, 1900 : 390 (*Myiophasia*). Lectotype ♂ (by fixation of Aldrich, 1922 : 5 as 'Type'), WESTERN AUSTRALIA (USNM, Washington) [examined]. – W.A.

Lectotype is labelled as from 'Tasmania' but species was described from 'West Australia'. The host beetle from which the type-material was reared is common in Western Australia but absent from Tasmania.

**subsessile** Malloch, 1931 : 297 (as *subsessilis*). Holotype ♀ [badly damaged], NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – A.C.T., N.S.W. (probably = *testaceum*)

**testaceum** Robineau-Desvoidy, 1830 : 429 (as *testacea*). Type(s), AUSTRALIA (lost). – AUSTRALIA (probably N.S.W.).

### Tribe MYIOTRIXINI Townsend

MYIOTRIXINI Townsend, 1936 : 17, 90. Type-genus: *Myiotrixia* Brauer & Bergenstamm, 1893.

#### Genus MYIOTRIXA Brauer & Bergenstamm

*Myiotrixia* Brauer & Bergenstamm, 1893 : 96 (8). Type-species: *Myiotrixia prosopina* Brauer & Bergenstamm, 1893, by original designation and monotypy.

**prosopina** Brauer & Bergenstamm, 1893 : 96 (8). Holotype ♂, AUSTRALIA (NM, Vienna) [examined]. – AUSTRALIA (state uncertain).

The provenance is shown on the type label as 'Austra. sept.' (i.e. northern Australia) but was published in the original description as 'W. Australien'. No other specimens are known and the provenance remains uncertain.

### Tribe ORMIINI Townsend

ORMIINAE Townsend, 1915a : 53. Type-genus: *Ormia* Robineau-Desvoidy, 1830.

#### Genus THEROBIA Brauer

*Therobia* Brauer, 1862 : 1231. Type-species: *Trypoderma abdominalis* Wiedemann, 1830, by monotypy. ('BENGAL').

*Therobiopsis* Townsend, 1919b : 166. Type-species: *Aulacephala braueri* Kertész, 1899, by original designation. (NEW GUINEA).

*Ormiminda* Paramonov, 1955 : 125. Type-species: *Ormiminda rieki* Paramonov, 1955, by original designation.

**riekei** Paramonov, 1955 : 126 (*Ormiminda*). Holotype ♀, QUEENSLAND: Ayr (ANIC, Canberra) [examined]. – QLD.

**secunda** Paramonov, 1955 : 127 (*Ormiminda*). Holotype ♂, QUEENSLAND: 10 mls W. of Collinsville (ANIC, Canberra) [examined]. – QLD.

### Tribe GLAUROCARINI Townsend

GLAUROCARINI Townsend, 1926c : 529. Type-genus: *Glaurocara* Thomson, 1869.

#### Genus DODDIANA Curran

*Doddiana* Curran, 1927b : 352. Type-species: *Doddiana pallens* Curran, 1927, by original designation.

*Semisuturia* Malloch, 1927 : 339. Type-species: *Semisuturia australis* Malloch, 1927, by original designation.

- australis** Malloch, 1927 : 340 (*Semisuturia*). Holotype ♀, QUEENSLAND: Eidsvold (SPHTM, Sydney) [examined]. – N.S.W., QLD.
- maculiventris** Malloch, 1933b : 136 (as var. of *australis*). Holotype ♀, NEW SOUTH WALES: National Park (SPHTM, Sydney) [examined].
- flavifrons** Malloch, 1930b : 342. Holotype ♀, QUEENSLAND: Eidsvold (SPHTM, Sydney) [examined]. – QLD.
- inermis** Malloch, 1933b : 138. Holotype ♂, QUEENSLAND: Innisfail (SPHTM, Sydney) [examined]. – QLD.
- pallens** Curran, 1927b : 353. Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde) [examined]. – QLD.
- parviseta** Malloch, 1930b : 341. Holotype ♀, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.

### Tribe **CAMPYLOCHETINI** Townsend

CAMPYLOCHETINI Townsend, 1936 : 21, 23, 229. Type-genus: *Campylocheta* Rondani, 1859.

#### Genus **ELPE** Robineau-Desvoidy

*Elpe* Robineau-Desvoidy, 1863 : 488. Type-species: *Tachina inepta* Meigen, 1824, by original designation. (GERMANY).

Undetermined spp. – N.S.W., S.A., TASM.

### Tribe **VORIINI** Townsend

VORIINI Townsend, 1912 : 50. Type-genus: *Voria* Robineau-Desvoidy, 1830.

#### Genus **HYSTRICOVORIA** Townsend

*Hystricovoria* Townsend, 1928 : 395. Type-species: *Hystricovoria bakeri* Townsend, 1928, by original designation. (PHILIPPINES).

Undetermined sp. – W.A.

#### Genus **HYLEORUS** Aldrich

*Hyleorus* Aldrich, 1926 : 16. Type-species: *Hyleorus furcatus* Aldrich, 1926, by monotypy.

**furcatus** Aldrich, 1926 : 16. Holotype ♀, QUEENSLAND: Cairns (USNM, Washington) [examined]. – QLD; NEW GUINEA.

#### Genus **VORIA** Robineau-Desvoidy

*Voria* Robineau-Desvoidy, 1830 : 195. Type-species: *Voria latifrons* Robineau-Desvoidy, 1830 [= *Tachina ruralis* Fallén, 1810], by monotypy. (EUROPE).

**ruralis** Fallén, 1810 : 265 (*Tachina*). Lectotype ♂ (by present designation), SWEDEN: Skåne, Esperöd (NR, Stockholm) [examined]. – N.S.W.; NEW GUINEA; widespread EURASIA, NORTH AMERICA, MEXICO, SOUTH AMERICA.

Identification of Australian specimens as *ruralis* correct on present evidence but confirmation needed.

Tribe **THELAIRINI** Lioy

**THELAREINI** Lioy, 1864 : 65. Type-genus: *Thelaira* Robineau-Desvoidy, 1830.

Genus **HALYDAIA** Egger

*Halydaia* Egger, 1856 : 383. Type-species: *Halydaia aurea* Egger, 1856, by subsequent designation of Brauer (1893 : 498). (AUSTRIA).

*Anaperistommyia* Townsend, 1926a : 15. Type-species: *Anaperistommyia optica* Townsend, 1926, by original designation. (SUMATRA).

*Macropia* Malloch, 1930b : 322. Type-species: *Macropia rufiventris* Malloch, 1930, by original designation.

*Halidaya*. Incorrect subsequent spelling of *Halydaia* Egger, 1856. [Not *Halidaya* Rondani, 1856 (Sepsidae)]

**mackerrasi** Paramonov, 1960 : 699 (*Halidaya*). Holotype ♂, QUEENSLAND: Palm Is. (ANIC, Canberra) [examined]. – QLD.

**norrisi** Paramonov, 1960 : 698 (*Halidaya*). Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Canberra (ANIC, Canberra) [examined]. – A.C.T., QLD.

**rufiventris** Malloch, 1930b : 322 (*Macropia*). Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.

Genus **THELAIRA** Robineau-Desvoidy

*Thelaira* Robineau-Desvoidy, 1830 : 214. Type-species: *Thelaira abdominalis* Robineau-Desvoidy, 1830 [= *Musca nigripes* Fabricius, 1794], by subsequent designation of Townsend (1916a : 9). (EUROPE).

*Thelairia*. Incorrect subsequent spelling of *Thelaira* Robineau-Desvoidy (Malloch, 1930a : 109–110).

*Therairia*. Incorrect subsequent spelling of *Thelaira* R.-D. (Hardy, 1934 : 32–33).

**australis** Walker, 1852 : 314 (*Dexia*). Holotype ♂, AUSTRALIA (BMNH, London) [examined]. – AUSTRALIA (state unknown).

Undetermined sp. – N.S.W.

[*leucozona* Panzer sensu Malloch (misidentification)].

Tribe **MINTHOINI** Brauer & Bergenstamm

**MINTHOIDAE** Brauer & Bergenstamm, 1889 : 78. Type-genus: *Mintho* Robineau-Desvoidy, 1830.

Genus **MINTHoxIA** Mesnil

*Minthoxia* Mesnil, 1968 : 184. Type-species: *Minthoxia dasyops* Mesnil, 1968, by original designation.

**dasyops** Mesnil, 1968 : 186. Holotype ♂, NEW SOUTH WALES: Lisarow (BMNH, London) [examined]. – N.S.W.

Genus **SUMPIGASTER** Macquart

*Sumpigaster* Macquart, 1855 : 124 (104). Type-species: *Sumpigaster fasciatus* Macquart, 1855, by monotypy.

*Atractodexia* Bigot, 1885b : xxxii. Type-species: *Atractodexia argentifera* Bigot, 1885 [= *Sumpigaster fasciatus* Macquart, 1855], by monotypy. (NEW CALEDONIA).

*Mesembriominto* Townsend, 1916c : 158. Type-species: *Mesembriominto compressa* Townsend, 1916 [= *Sumpigaster fasciatus* Macquart, 1855], by original designation.

**fasciatus** Macquart, 1855 : 125 (105). Holotype ♂, QUEENSLAND: Moreton Bay (BMNH, London) [examined]. — N.S.W., QLD; NEW CALEDONIA, LOYALTY IS.

*argentifera* Bigot, 1885b : xxxii (*Atractodexia*). Holotype ♂, NEW CALEDONIA (BMNH, London) [examined].

*compressa* Townsend, 1916c : 159 (*Mesembriominto*). Holotype ♂, QUEENSLAND: Hamilton, Upper North Pine (USNM, Washington) [examined].

### Tribe NEMORAEINI Robineau-Desvoidy

NEMOREIDAE Robineau-Desvoidy, 1863 (1) : 171. Type-genus : *Nemoraea* Robineau-Desvoidy, 1830.

#### Genus NEMORAEA Robineau-Desvoidy

*Nemoraea* Robineau-Desvoidy, 1830 : 71. Type-species : *Nemoraea bombylans* Robineau-Desvoidy, 1830 [= *Tachina pellucida* Meigen, 1824], by subsequent designation of Townsend (1916a : 8). (EUROPE).

Undescribed sp. — N.S.W., QLD.

### Tribe LESKIINI Townsend

LESKIINI Townsend, 1919c : 20. Type-genus: *Leskia* Robineau-Desvoidy, 1830.

#### Genus APATEMYIA Macquart

*Apatomyia* Macquart, 1846 : 325 (197). Type-species: *Apatomyia longipes* Macquart, 1846, by monotypy.

**flavipes** Macquart, 1851 : 160 (187) (*Exorista*). Holotype ♀, [TASMANIA, publ. as 'Oceania'] (MNHN, Paris) [examined]. **Comb. n.** — TASM.

**longipes** Macquart, 1846 : 325 (197). Lectotype ♂ (by designation of Crosskey, 1971 : 263), TASMANIA (MNHN, Paris) [examined]. — TASM.

**rufiventris** Macquart, 1847 : 98 (82) (*Calliphora*). Holotype ♀, TASMANIA (BMNH, London) [examined]. **Comb. n.** — TASM. (Possibly = *longipes* ♀).

#### Genus DEMOTICOIDES Mesnil

*Demoticoides* Mesnil, 1953 : 150. Type-species: *Demoticoides pallidus* Mesnil, 1953, by monotypy. (INDIA).

**pallidus** Mesnil, 1953 : 150. Holotype ♂, INDIA: Madras, Nilambur (BMNH, London) [examined]. — QLD; INDIA.

#### Genus EXECHOPALPUS Macquart

*Exechopalpus* Macquart, 1847 : 91 (75). Type-species: *Exechopalpus rufipalpus* Macquart, 1847, by monotypy.

**dubitalis** Malloch, 1930a : 132. Holotype ♂, WESTERN AUSTRALIA: Tammin (SPHTM, Sydney) [examined]. — W.A.

- fulvipes* Malloch, 1930a : 132. Holotype ♀, WESTERN AUSTRALIA: Eradu (SPHTM, Sydney) [examined]. – W.A.
- nigripes* Malloch, 1930a : 132. Holotype ♀, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.
- atripes* Malloch, 1930a : 131. [Lapsus for *nigripes* in key to species.]
- rufifemur* Malloch, 1930a : 131. Holotype ♂, WESTERN AUSTRALIA: Eradu (SPHTM, Sydney) [examined]. – W.A.
- rufofemorata* Malloch, 1930a : 128. [Lapsus for *rufifemur* in legend, fig. 28.]
- rufipalpus* Macquart, 1847 : 92 (76). Holotype ♂, AUSTRALIA (BMNH, London) [examined]. – AUSTRALIA (state unknown).
- rufipalpis*. Incorrect subsequent spelling of *rufipalpus* Macquart (Malloch, 1930a : 130, 132).

### Genus *RHINOMYOBIA* Brauer & Bergenstamm

- Rhinomyobia* Brauer & Bergenstamm, 1893 : 140 (52). Type-species: *Rhinomyobia australis* Brauer & Bergenstamm, 1893, by original designation and monotypy.
- Rhinomyiobia*. Incorrect subsequent spelling of *Rhinomyobia* Brauer & Bergenstamm.
- australis* Brauer & Bergenstamm, 1893 : 140 (52). Holotype ♀, AUSTRALIA (not located). – A.C.T., N.S.W.
- The holotype should be in NM, Vienna, but has not been found in that collection (although at some time seen there by Townsend).

### Genus *SIPHOLESKIA* Townsend

- Sipholeskia* Townsend, 1916b : 628. Type-species: *Drepanoglossa occidentalis* Coquillett, 1895, by original designation. (NORTH AMERICA).
- certima* Curran, 1927b : 351 (*Demoticus*). Holotype ♀, QUEENSLAND: Kuranda (DEI, Eberswalde) [examined]. **Comb. n.** – QLD.

### Genus *TOXOCNEMIS* Macquart

- Toxocnemis* Macquart, 1855 : 123 (103). Type-species: *Toxocnemis vittata* Macquart, 1855, by monotypy.
- Toxonemis*. Incorrect subsequent spelling of *Toxocnemis* Macquart (Hardy, 1934 : 33).
- vittata* Macquart, 1855 : 124 (104). Holotype ♂, SOUTH AUSTRALIA: Adelaide (BMNH, London) [examined]. – N.S.W., S.A.

### Unplaced species of Leskiini

- transversalis* Malloch, 1930a : 130 (*Rhinomyiobia*). Holotype ♀, QUEENSLAND: Cairns district (SPHTM, Sydney) [examined]. – QLD.
- This species, and allied forms in Fiji and New Guinea, appear to represent an undescribed genus.

### Tribe *ERNESTIINI* Townsend

- ERNESTIINI* Townsend, 1912 : 50. Type-genus: *Ernestia* Robineau-Desvoidy, 1830.

Genus **AMPHITROPESA** Townsend

*Amphitropesa* Townsend, 1933 : 463. Type-species: *Amphitropesa elegans* Townsend, 1933, by original designation.

**elegans** Townsend, 1933 : 464. Holotype ♀, NEW SOUTH WALES (BMNH, London) [examined]. – N.S.W.

Genus **CHLOROTACHINA** Townsend

*Chlorotachina* Townsend, 1915b : 21. Type-species: *Chrysosoma flaviceps* Macquart, 1851, by original designation.

*Chlorodexia* Townsend, 1916c : 154. Type-species: *Chlorodexia froggattii* Townsend, 1916, by original designation.

**flaviceps** Macquart, 1851 : 158 (185) (*Chrysosoma*). Holotype ♂, AUSTRALIA (MNHN, Paris) [examined]. – N.S.W., QLD, VICT., W.A.

**froggattii** Townsend, 1916c : 154 (*Chlorodexia*). Holotype ♂, NEW SOUTH WALES: Merriwa (USNM, Washington) [examined]. – N.S.W., QLD.

*froggatti*. Incorrect subsequent spelling of *froggattii* Townsend (Malloch, 1929b : 324, 326).

**nigrocaerulea** Malloch, 1929b : 324. Holotype ♂, WESTERN AUSTRALIA: King George's Sound (AM, Sydney) [examined]. – W.A., TASM. (?).

Undescribed sp. – S.A., TASM.

Genus **MACROCHLORIA** Malloch

*Macrochloria* Malloch, 1929b : 326. Type-species: *Macrochloria calliphorosoma* Malloch, 1929 [= *Nemoraea nitidiventris* Macquart, 1851], by original designation.

**nitidiventris** Macquart, 1851 : 155 (182) (*Nemoraea*). Holotype ♂, AUSTRALIA (MNHN, Paris) [examined]. **Comb. n.** – N.S.W., TASM.

*calliphorosoma* Malloch, 1929b : 326. Holotype ♂, NEW SOUTH WALES: Barrington Tops (AM, Sydney) [examined]. **Syn. n.**

**rufipes** Malloch, 1936 : 20 (as var. of *calliphorosoma*). Holotype ♂, NEW SOUTH WALES: Toronto (SPHTM, Sydney) [examined]. **Syn. n.**

Genus **NEXIMYIA** Crosskey

*Neophasia* Brauer & Bergenstamm, 1893 : 100 (12). Type-species: *Neophasia picta* Brauer & Bergenstamm, 1893, by original designation and monotypy. [Junior homonym of *Neophasia* Behr, 1869.]

*Euphasia* Townsend, 1908 : 76. [Replacement name proposed for *Neophasia* Brauer & Bergenstamm, but itself a junior homonym of *Euphasia* Stephens, 1830, and *Euphasia* Mulsant & Verreaux, 1876.]

*Neximyia* Crosskey, 1967a : 20. [Replacement name for *Euphasia* Townsend.]

**picta** Brauer & Bergenstamm, 1893 : 210 (122) (*Neophasia*). Holotype ♀, WESTERN AUSTRALIA (NM, Vienna) [examined]. – N.S.W., W.A.

Tribe **PARERIGONINI** Mesnil

PARERIGONINA Mesnil, 1966 : 888. Type-genus: *Parerigone* Brauer, 1898.

Genus **AUSTRALOTACHINA** Curran

*Australotachina* Curran, 1938 : 194. Type-species: *Australotachina calliphoroides* Curran, 1938, by original designation.

**calliphoroides** Curran, 1938 : 195. Holotype ♂, QUEENSLAND: Kuranda (DEI, Eberswalde) [examined]. — QLD.

Genus **LEVERELLA** Baranov

*Leverella* Baranov, 1934a : 473. Type-species: *Leverella institutiimperialis* Baranov, 1934, by original designation. (SOLOMON ISLANDS).

Undetermined sp. — QLD.

Genus **PYGIDIMYIA** Crosskey

*Pygidia* Malloch, 1930b : 330. Type-species: *Pygidia rufolateralis* Malloch, 1930, by original designation. [Junior homonym of *Pygidia* Mulsant & Rey, 1861.]

*Pygidimyia* Crosskey, 1967a : 25. [Replacement name for *Pygidia* Malloch.]

**rufolateralis** Malloch, 1930b : 331 (*Pygidia*). Holotype ♂, NEW SOUTH WALES: Kosciusko (ANIC, Canberra) [examined]. — N.S.W.

Genus **ZITA** Curran

*Zita* Curran, 1927b : 351. Type-species: *Zita aureopyga* Curran, 1927, by original designation.

**aureopyga** Curran, 1927b : 351. Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde) [examined]. — QLD.

Undetermined sp. — N.S.W.

Tribe **LINNAEMYINI** Townsend

LINNAEMYINI Townsend, 1919a : 591. Type-genus: *Linnaemya* Robineau-Desvoidy, 1830.

Genus **APALPUS** Malloch

*Apalpus* Malloch, 1929b : 318. Type-species: *Apalpus dorsalis* Malloch, 1929, by original designation.

**dorsalis** Malloch, 1929b : 318. Holotype ♀, WESTERN AUSTRALIA: Eradu, near Geraldton (ANIC, Canberra) [examined]. — S.A., W.A.

Genus **CHAETOPHTHALMUS** Brauer & Bergenstamm

*Chaetophthalmus* Brauer & Bergenstamm, 1891 : 383 (79). Type-species: *Micropalpus brevigaster* Macquart, 1846, by subsequent designation of Townsend (1916a : 6). [Type-species not fixed by Brauer & Bergenstamm, 1893; see Crosskey, 1967a : 9.]

*Ballardia* Curran, 1927a : 166. Type-species: *Ballardia pallipes* Curran, 1927, by original designation.

[*Amphibolosia* Surcouf sensu authors (misidentification)]

[*Aprotheca* Macquart sensu Hardy, 1959 : 215 (misidentification)]

- bicolor** Macquart, 1848 : 204 (44) (*Micropalpus*). Holotype ♀, AUSTRALIA (lost). – N.S.W., QLD.
- biseriatus** Malloch, 1930b : 311. Holotype ♂, NEW SOUTH WALES: Narromine (USNM, Washington) [examined]. – N.S.W., QLD, S.A.
- brevigaster** Macquart, 1846 : 277 (149) (*Micropalpus*). Holotype ♂, TASMANIA (BMNH, London) [examined]. – TASM., N.S.W. & QLD (?).
- pallipes** Curran, 1927a : 166 (*Ballardia*). Holotype ♂ [head lost], QUEENSLAND: Brisbane (BMNH, London) [examined]. – QLD. (Possibly = *bicolor*).
- ruficeps** Macquart, 1847 : 89 (73) (*Myobia*). Holotype ♂, TASMANIA (BMNH, London) [examined]. **Comb. n.** – TASM.
- similis** Walker, 1852 : 266 (*Tachina*). Holotype ♂, NEW SOUTH WALES (BMNH, London) [examined]. – N.S.W., VICT.

### Genus *LINNAEMYA* Robineau-Desvoidy

- Linnaemya* Robineau-Desvoidy, 1830 : 52. Type-species: *Linnaemya silvestris* Robineau-Desvoidy, 1830 [= *Tachina vulpina* Fallén, 1810], by subsequent designation of Robineau-Desvoidy (1863 : 131, as *vulpina* with *silvestris* cited in synonymy). (EUROPE).
- Linnaemyia*. Incorrect subsequent spelling of *Linnaemya* Robineau-Desvoidy.
- concavicornis** Macquart, 1851 : 146 (173) (*Micropalpus*). Holotype ♂ [not ♀], AUSTRALIA [prob. NEW SOUTH WALES, publ. 'côte orientale'] (MNHN, Paris) [examined]. **Comb. n.** – QLD, N.S.W. (?).
- nigripalpus** Tryon, 1900 : 144 (*Linnaemyia*). Type(s), QUEENSLAND (Not located, possibly lost). **Syn. n.**

### Tribe TACHININI Robineau-Desvoidy

TACHINARIAE Robineau-Desvoidy, 1830 : 185. Type-genus: *Tachina* Meigen, 1803.

### Genus *CUPHOCERA* Macquart

- Cuphocera* Macquart, 1845 : 267. Type-species: *Micropalpus ruficornis* Macquart, 1835, by original designation. (EUROPE).
- Acuphocera* Townsend, 1926a : 37. Type-species: *Acuphocera sumatrensis* Townsend, 1926 [= *Musca varia* Fabricius, 1794], by original designation. (SUMATRA).
- emmesia** Malloch, 1930b : 318. Holotype ♂, WESTERN AUSTRALIA: Geraldton (SPHTM, Sydney) [examined]. – W.A.
- pilifacies** Macquart, 1851 : 146 (173) (*Micropalpus*). Holotype ♂ [not ♀], AUSTRALIA [prob. NEW SOUTH WALES, publ. 'côte orientale'] (MNHN, Paris) [examined]. **Comb. n.** – N.S.W. (?).
- pilosa** Malloch, 1930b : 316. Holotype ♂, NEW SOUTH WALES: Woy Woy (not located, probably lost; paratype ♂ in USNM, Washington). – N.S.W.
- setigera** Malloch, 1930b : 318. Holotype ♂, NEW SOUTH WALES: Kosciusko (SPHTM, Sydney) [examined]. – A.C.T., N.S.W.
- vittata** Macquart, 1846 : 278 (150) (*Micropalpus*). Holotype ♂, TASMANIA (MNHN, Paris) [examined]. – TASM.
- varia** Fabricius, 1794 : 327 (*Musca*). Holotype ♀, EAST INDIES (publ. 'Ind. or.') (UZM, Copenhagen) [examined]. – QLD; NEW GUINEA; widespread ORIENTAL REGION.
- sumatrensis* Townsend, 1926a : 37. Lectotype ♂ (by designation of Crosskey, 1969 : 90), SUMATRA: Fort de Kock (ZM, Amsterdam) [examined].
- (For other synonyms, based on Oriental types, see Crosskey, 1966a : 674)

Genus *ERISTALIOMYIA* Townsend

*Eristaliomyia* Townsend, 1926a : 37. Type-species: *Eristaliomyia nitidifrons* Townsend, 1926 [= *Echinomyia brevipennis* Walker, 1857], by original designation. (SUMATRA).  
[? *Peleteria* Robineau-Desvoidy sensu Hardy, 1938 : 66 (misidentification)]

Undescribed sp. – QLD.

Genus *MICROTROPESA* Macquart

*Microtropesa* Macquart, 1846 : 313 (185). Type-species: *Musca sinuata* Donovan, 1805, by monotypy.

*Gerotachina* Townsend, 1916c : 152. Type-species: *Tachina obtusa* Walker, 1852, by original designation.

*Microtopeza*. Incorrect subsequent spelling of *Microtropesa* Macquart.

[*Tasmaniomyia* Townsend sensu Hardy, 1939 : 33 (misidentification)]

*campbelli* Paramonov, 1951 : 768. Holotype ♀, AUSTRALIAN CAPITAL TERRITORY: Blundell's (ANIC, Canberra) [examined]. – A.C.T.

*canberrae* Paramonov, 1951 : 771. Holotype ♀, AUSTRALIAN CAPITAL TERRITORY: Canberra, Black Mt. (ANIC, Canberra) [examined]. – A.C.T.

*flavitarsis* Malloch, 1929b : 288. Holotype ♂, TASMANIA (AM, Sydney) [examined]. – W.A., S.A. (?).

*flaviventris* Malloch, 1930a : 101. Holotype ♀, NEW SOUTH WALES: Narromine (ANIC, Canberra) [examined]. – A.C.T., N.S.W., QLD.

*intermedia* Malloch, 1930a : 100. Holotype ♂, QUEENSLAND: Eidsvold (ANIC, Canberra) [examined]. – A.C.T., N.S.W., QLD.

*latigena* Paramonov, 1951 : 769. Holotype ♀, WESTERN AUSTRALIA: Kalgoorlie (WADA, Perth). – S.A., W.A.

*nigricornis* Macquart, 1851 : 199 (226). Lectotype ♂ (by designation of Crosskey, 1971 : 278), TASMANIA (MNHN, Paris) [examined]. – TASM.

*obtusa* Walker, 1852 : 274 (*Tachina*). Lectotype ♀ (by fixation of Townsend, 1932 : 40, as 'Ht'), NEW SOUTH WALES (BMNH, London) [examined]. – N.S.W.

*stolida* Walker, 1858 : 195 (*Echinomyia*). Holotype ♂, NEW SOUTH WALES (BMNH, London) [examined].

*ochriventris* Malloch, 1929b : 287. Holotype ♀, NEW SOUTH WALES: Barrington Tops (ANIC, Canberra) [examined]. – N.S.W., TASM., VICT.

*sinuata* Donovan, 1805 : plate fig. (unnumbered) & description (unpaginated) (*Musca*). Type(s) [♂], AUSTRALIA (lost). – A.C.T., N.S.W., QLD, TASM., VICT., W.A.

Publication date of this name has usually been cited as 1798 in error. Type-material of *sinuata* has never been located and is presumed lost (Townsend's, 1932 : 40, statement of ♀ holotype in London is in error). The identity is certain from Donovan's coloured figure, painted it appears from a ♂ specimen.

*bura* Walker, 1849 : 760 (*Tachina*). Lectotype ♂ (by present designation), TASMANIA (BMNH, London) [examined].

*ignipennis* Brauer, 1899 : 510. [Unavailable name first published as a synonym of *sinuata* and no later validation; see Crosskey, 1971 : 278.]

*latimana* Malloch, 1929b : 287. Holotype ♀, QUEENSLAND (AM, Sydney) [examined].

*skusei* Bergroth, 1894 : 73. Type(s) ♀, QUEENSLAND: Duaringa, Coomooboolaroo (not located). QLD.

The type-material of this species has not been found in the Zoological Museum, Helsinki (the most likely depository) and is possibly lost.

*violacescens* Enderlein, 1937 : 441 (*Microtopeza*, sic, lapsus). Lectotype ♂ (by present designation), QUEENSLAND: Herberton (DEI, Eberswalde). – N.S.W., N.T., QLD, W.A., TASM. (?).

- fallax* Hardy, 1939 : 35. Holotype ♀, QUEENSLAND: Brisbane (not located). **Syn. n.**  
 [*sinuata* Donovan sensu Malloch (misidentification)]  
*viridescens* Paramonov, 1951 : 765. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Canberra  
 (ANIC, Canberra) [examined]. – A.C.T., W.A.

### Subfamily GONIINAE Robineau-Desvoidy

GONIDAE Robineau-Desvoidy, 1830 : 74. Type-genus: *Gonia* Meigen, 1803.

### Tribe ACEMYINI Brauer & Bergenstamm

ACEMYIDAE Brauer & Bergenstamm, 1889 : 80. Type-genus: *Acemya* Robineau-Desvoidy, 1830.

### Genus CERACIA Rondani

- Ceracia* Rondani, 1865 : 221. Type-species: *Ceracia mucronifera* Rondani, 1865, by monotypy.  
 (ITALY).  
*Myothyria* Wulp, 1890 : 208. Type-species: *Myothyria majorina* Wulp, 1890, by subsequent  
 designation of Coquillett (1910 : 573). (MEXICO).  
*armata* Malloch, 1930b : 340 (*Myothyria*). Holotype ♀, NEW SOUTH WALES: Kosciusko  
 (SPHTM, Sydney) [examined]. **Comb. n.** – A.C.T., N.S.W., TASM. (Probably = *fergusoni*).  
*fergusoni* Malloch, 1930b : 339 (*Myothyria*). Holotype ♂, WESTERN AUSTRALIA: Eradu  
 (SPHTM, Sydney) [examined]. **Comb. n.** – A.C.T., N.S.W., N.T., QLD, S.A., VICT., W.A.

### Tribe NEAERINI Mesnil

NAEREINA [sic] Mesnil, 1956 : 557. Type-genus: *Neaera* Robineau-Desvoidy, 1830.

### Genus VORIELLA Malloch

- Voriella* Malloch, 1930b : 335. Type-species: *Voriella uniseta* Malloch, 1930, by original  
 designation (as *V. recedens* by lapsus: Malloch, 1931 : 298).  
*uniseta* Malloch, 1930b : 335. Holotype ♂, NEW SOUTH WALES: Sydney (ANIC, Canberra)  
 [examined]. – A.C.T., N.S.W., VICT.  
*recedens* Malloch, 1930b : 335. [Lapsus for *uniseta* in citation of *Voriella* type-species; see  
 Malloch, 1931 : 298.]

? new genera

Undescribed spp. – N.S.W., QLD, S.A.

### Tribe SIPHONINI Rondani

SIPHONAE Rondani, 1845 : 31. Type-genus: *Siphona* Meigen, 1803.

### Genus ACTIA Robineau-Desvoidy

- Actia* Robineau-Desvoidy, 1830 : 85. Type-species: *Actia pilipennis* Robineau-Desvoidy, 1830  
 (junior secondary homonym of *pilipennis* Fallén, 1810) [= *Roeselia lamia* Meigen, 1838].  
 Suspension of ICZN Rules required (see Sabrosky & Arnaud, 1965 : 1061). (EUROPE).

- brevis** Malloch, 1930b : 309. Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.
- darwini** Malloch, 1929b : 334. Holotype ♂, NORTHERN TERRITORY: Darwin (SPHTM, Sydney) [examined]. – N.T., QLD.
- eucosmae** Bezzi, 1926 : 239. Holotype ♀, QUEENSLAND: Milton Farm (publ. as 'Brisbane') (BMNH, London) [examined]. – N.S.W., QLD, S.A.
- lata** Malloch, 1930b : 307. Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.
- quadriseta** Malloch, 1936 : 20. Holotype ♀, NEW SOUTH WALES: Nyngan (SPHTM, Sydney) [examined]. – N.S.W.

### Genus *CEROMYA* Robineau-Desvoidy

- Ceromya* Robineau-Desvoidy, 1830 : 86. Type-species: *Ceromya testacea* Robineau-Desvoidy, 1830 [= *Tachina bicolor* Meigen, 1824], by subsequent designation of Coquillett (1910 : 520). (EUROPE).
- Schizoceromyia* Townsend, 1926c : 542. Type-species: *Schizotachina fergusoni* Bezzi, 1923, by original designation. **Syn. n.**
- Schizactiana* Curran, 1927b : 356 (as subg. of *Actia*). Type-species: *Actia (Schizactiana) valida* Curran, 1927, by original designation. **Syn. n.**
- Ceromyia*. Incorrect subsequent spelling of *Ceromya* Robineau-Desvoidy.
- Schizactina*. Incorrect subsequent spelling of *Schizactiana* Curran (Hardy, 1959 : 213).
- fergusoni** Bezzi, 1923 : 657 (*Schizotachina*). Holotype ♂, NEW SOUTH WALES: Sydney (not located). **Comb. n.** – N.S.W.
- The holotype was stated by Bezzi to be in the Microbiological Laboratory, Sydney, but has not been located.
- fergussoni**. Incorrect subsequent spelling of *fergusoni* Bezzi (Curran, 1927b : 355–356).
- invalida** Malloch, 1930b : 305 (*Actia*). Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.
- norma** Malloch, 1929a : 116 (*Actia*). Holotype ♂, NEW SOUTH WALES: Como (USNM, Washington) [examined]. – N.S.W., VICT., W.A.
- parviseta** Malloch, 1930b : 308 (*Actia*). Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.
- valida** Curran, 1927b : 356 (*Actia*). Holotype ♂, QUEENSLAND: Palmerston (DEI, Eberswalde) [examined]. **Comb. n.** – QLD.

### Genus *PERIBAEA* Robineau-Desvoidy

- Herbstia* Robineau-Desvoidy, 1851 : 184. Type-species: *Herbstia tibialis* Robineau-Desvoidy, 1851, by monotypy. [Junior homonym of *Herbstia* Edwards, 1834.] (FRANCE).
- Peribaea* Robineau-Desvoidy, 1863 : 720. Type-species: *Peribaea apicalis* Robineau-Desvoidy, 1863 [= *Herbstia tibialis* Robineau-Desvoidy, 1851], by subsequent designation of Coquillett (1910 : 587). (FRANCE).
- Strobliomyia* Townsend, 1926b : 31. Type-species: *Thryptocera fissicornis* Strobl, 1910, by original designation. (AUSTRIA).
- Eogymnophthalma* Townsend, 1926a : 35. Type-species: *Eogymnophthalma orientalis* Townsend, 1926 [= *Tachina orbata* Wiedemann, 1830], by original designation. (SUMATRA).
- Talaractia* Malloch, 1930b : 305 (as subg. of *Actia*). Type-species: *Actia (Talaractia) baldwini* Malloch, 1930, by original designation.
- Tararactia*. Incorrect multiple original spelling of *Talaractia* Malloch.
- Uschizactia* Townsend, 1934 : 248. Type-species: *Actia uniseta* Malloch, 1930, by original designation. (MALAYA).

- argentifrons** Malloch, 1930b : 309 (*Actia*). Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W., QLD.
- angustifrons*. Incorrect subsequent spelling, lapsus for *argentifrons* Malloch (Hardy, 1959 : 213).
- baldwini** Malloch, 1930b : 306 (*Actia*). Holotype ♂, QUEENSLAND: Palm Is. (SPHTM, Sydney) [examined]. **Comb. n.** – QLD.
- orbata** Wiedemann, 1830 : 336 (*Tachina*). Neotype ♀ (by designation of Crosskey, 1967d : 106), EASTERN INDIA: Assam, Azra (BMNH, London) [examined]. **Comb. n.** – N.S.W., QLD; NEW GUINEA; widespread in ORIENTAL REGION, MIDDLE EAST, AFRICA.
- aegyptia* Villeneuve, 1912 : 508 (*Gymnopareia*). Lectotype ♂ (by designation of Crosskey, 1966b : 108), EGYPT: Qaliūb (BMNH, London) [examined].
- orientalis* Townsend, 1926a : 35 (*Eogymnophthalma*). Lectotype ♂ (by fixation of Townsend, 1940 : 213), SUMATRA: Fort de Kock (ZM, Amsterdam) [examined].
- nigritula* Malloch, 1930b : 309 (*Actia*). Holotype ♀, QUEENSLAND: Cairns (SPHTM, Sydney) [examined].
- monticola* Malloch, 1930c : 143 (*Actia*). Holotype ♂ [head lost], PHILIPPINES: Negros, Cuernos Mts. (USNM, Washington) [examined].
- rotundipennis* Malloch, 1930c : 143 (*Actia*). Holotype ♀ [head lost], PHILIPPINES: Negros, Cuernos Mts. (USNM, Washington) [examined].
- sororcula* Mesnil, 1954a : 16 (*Strobliomyia*). Holotype ♀, ZAÏRE REPUBLIC: Rutshuru (MRAC, Tervuren).
- plebeia** Malloch, 1930b : 310 (*Actia*). Holotype ♂, NEW SOUTH WALES: Coramba (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W., QLD.
- plebia*. Incorrect subsequent spelling of *plebeia* Malloch (Hardy, 1959 : 213).

### Tribe BLONDELIINI Robineau-Desvoidy

BLONDELIDAE Robineau-Desvoidy, 1863 (2) : 24. Type-genus: *Blondelia* Robineau-Desvoidy, 1830.

### Genus ANAGONIA Brauer & Bergenstamm

- Anagonia* Brauer & Bergenstamm, 1891 : 348 (44). Type-species: *Anagonia spylosioides* Brauer & Bergenstamm, 1891 [= *Masicera rufifacies* Macquart, 1847], by original designation and monotypy.
- Acephana* Townsend, 1916c : 153. Type-species: *Masicera rubrifrons* Macquart, 1847, [= *Masicera rufifacies* Macquart, 1847], by original designation.
- Opsophana* Townsend, 1916c : 153. Type-species: *Masicera rufifacies* Macquart, 1847, by original designation.
- anguliventris** Malloch, 1932b : 273 (*Froggattimyia*). Holotype ♀, AUSTRALIAN CAPITAL TERRITORY: Canberra (USNM, Washington) [examined]. **Comb. n.** – A.C.T.
- grisea** Malloch, 1930b : 333 (*Delta*). Holotype ♀, WESTERN AUSTRALIA: Mullewa (ANIC, Canberra) [examined]. **Comb. n.** – W.A.
- lasiophthalma** Malloch, 1934 : 6 (*Froggattimyia*). Holotype ♀, AUSTRALIAN CAPITAL TERRITORY: Canberra, Black Mt. (ANIC, Canberra) [examined]. **Comb. n.** – A.C.T.
- lateralis** Macquart, 1846 : 291 (163) (*Masicera*). Lectotype ♂ (by designation of Crosskey, 1971 : 274), AUSTRALIA (BMNH, London) [examined]. **Comb. n.** – N.S.W., QLD.
- major** Malloch, 1930b : 334 (*Delta*). Holotype ♂, NEW SOUTH WALES: Eccleston, Allyn River (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W., QLD.
- opaca** Malloch, 1930b : 334 (*Delta*). Holotype ♀, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. **Comb. n.** – N.S.W.

- rufifacies** Macquart, 1847 : 87 (71) (*Masicera*). Holotype ♂, 'TASMANIA' (BMNH, London) [examined]. – A.C.T., TASM.
- rubrifrons** Macquart, 1847 : 85 (69) (*Masicera*). Holotype ♀, TASMANIA (BMNH, London) [examined].
- spylosioides** Brauer & Bergenstamm, 1891 : 349 (45). Lectotype ♂ (by designation of Crosskey 1966b : 108), TASMANIA (NM, Vienna) [examined].
- scutellata** Malloch, 1930b : 334 (*Delta*). Holotype ♂, WESTERN AUSTRALIA: Mullewa (SPHTM, Sydney) [examined]. **Comb. n.** – A.C.T., N.S.W., VICT., W.A.

### Genus *COMPSILURA* Bouché

- Compsilura* Bouché, 1834 : 58. Type-species: *Tachina concinnata* Meigen, 1824, by subsequent designation of Coquillett (1910 : 526). (EUROPE).
- concinnata** Meigen, 1824 : 412 (*Tachina*). Holotype ♀, CENTRAL EUROPE [? AUSTRIA or GERMANY] (? NM, Vienna, coll. von Winthem). – QLD; widespread OLD WORLD; NORTH AMERICA (introduced & established).

### Genus *DELTOMYZA* Malloch

- Delta* Malloch, 1930b : 332. Type-species: *Delta australiensis* Malloch, 1930, by original designation. [Junior homonym of *Delta* de Saussure, 1855, and *Delta* Saalmueller, 1891.]
- Deltomyza* Malloch, 1931 : 298. [Replacement name for *Delta* Malloch.]
- Mallochiola* Strand, 1932 : 195. [Proposed as replacement name for *Delta* Malloch; junior homonym of *Mallochiola* Bergroth, 1925.]
- australiensis** Malloch, 1930b : 332 (*Delta*). Holotype ♂, WESTERN AUSTRALIA: Mullewa (SPHTM, Sydney) [examined]. – W.A.

### Genus *FROGGATTIMYIA* Townsend

- Froggattimyia* Townsend, 1916c : 155. Type-species: *Froggattimyia hirta* Townsend, 1916, by original designation.
- Protomeigenia* Townsend, 1916c : 156. Type-species: *Protomeigenia aurea* Townsend, 1916, by original designation.
- aurea** Townsend, 1916c : 156 (*Protomeigenia*). Holotype ♂, NEW SOUTH WALES: Manilla (USNM, Washington) [examined]. – N.S.W.
- fergusoni** Malloch, 1934 : 4. Holotype ♂, WESTERN AUSTRALIA: Wyalkatchem (SPHTM, Sydney) [examined]. – W.A.
- hirta** Townsend, 1916c : 156. Holotype ♂, NEW SOUTH WALES: Sydney (publ. as 'Mittagong') (USNM, Washington) [examined]. – N.S.W., QLD.
- nicholsoni** Malloch, 1934 : 5. Holotype ♂, NEW SOUTH WALES: Lindfield (publ. as 'Sydney') (SPHTM, Sydney) [examined]. – N.S.W., QLD.
- tillyardi** Malloch, 1934 : 6. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Blundell's (ANIC, Canberra) [examined]. – A.C.T.
- wentworthi** Malloch, 1934 : 3. Holotype ♂, NEW SOUTH WALES: Wentworth Falls (SPHTM, Sydney) [examined]. – N.S.W., VICT. (Possibly = *nicholsoni*)

### Genus *LECANIPA* Rondani

- Lecanipa* Rondani, 1859 : 156. Type-species: *Lecanipa patellifera* Rondani, 1859 [= *Tachina leucomelas* Meigen, 1824], by original designation. (EUROPE).
- Lecanipus*. Incorrect subsequent spelling of *Lecanipa* Rondani.
- Undescribed sp. (1) – VICT.
- Undescribed sp. (2) – S.A.

Genus *LIXOPHAGA* Townsend

*Lixophaga* Townsend, 1908 : 86. Type-species: *Lixophaga parva* Townsend, 1908, by original designation. (NORTH AMERICA).

*Microceromasia* Villeneuve, 1911 : 82. Type-species: *Ceromasia sphenophori* Villeneuve, 1911, by original designation. (NEW GUINEA).

**sphenophori** Villeneuve, 1911 : 82. (*Ceromasia*). Lectotype ♀ (by present designation), NEW GUINEA: Papua [Laloki River near Port Moresby] (ZM, Amsterdam) [examined]. – NEW GUINEA; MOLUCCAS. Introduced QLD (? established), FIJI (? established), HAWAII (established).

Genus *MEDINODEXIA* Townsend

*Medinodexia* Townsend, 1927a : 57. Type-species: *Medinodexia fulviventris* Townsend, 1927, by original designation. (SUMATRA).

**morgani** Hardy, 1934 : 37 (*Zosteromyia*). Lectotype ♂ (by present designation), NEW SOUTH WALES: Biniguy (NSWDA, Rydalmere) [examined]. **Comb. n.** – N.S.W., QLD; CEYLON.

Genus *MONOLEPTOPHAGA* Townsend

*Monoleptophaga* Baranov, 1938b : 411. Type-species: *Monoleptophaga caldwelli* Baranov, 1938, by original designation.

**caldwelli** Baranov, 1938 : 411. Lectotype ♂ (by designation of Sabrosky & Crosskey, 1969 : 47), QUEENSLAND: Nambour (BMNH, London) [examined]. – QLD.

Genus *PAREUPOGONA* Townsend

*Pareupogona* Townsend, 1916c : 157. Type-species: *Masicera oblonga* Macquart, 1847, by original designation.

**oblonga** Macquart, 1847 : 86 (70) (*Masicera*). Holotype ♂, TASMANIA (BMNH, London) [examined]. – TASM.

**simplex** Macquart, 1847 : 87 (71) (*Masicera*). Holotype ♂, TASMANIA (BMNH, London) [examined].

Genus *PAROPSIVORA* Malloch

*Paropsivora* Malloch, 1934 : 7. Type-species: *Paropsivora grisea* Malloch, 1934, by original designation.

**australis** Macquart, 1847 : 84 (68) (*Degeeria*). Holotype ♀, TASMANIA (BMNH, London) [examined]. **Comb. n.** – TASM.

**graciliseta** Macquart, 1847 : 88 (72) (*Phorocera*). Holotype ♂, TASMANIA (BMNH, London) [examined]. **Comb. n.** – N.S.W., QLD, TASM.

**acutangulata** Macquart, 1848 : 208 (48) (*Phorocera*). Holotype ♂, AUSTRALIA (BMNH, London) [examined]. **Syn. n.**

**grisea** Malloch, 1934 : 7. Holotype ♀, AUSTRALIAN CAPITAL TERRITORY: Blundell's (ANIC, Canberra) [examined] – A.C.T.

**tessellata** Macquart, 1846 : 293 (165) (*Phorocera*). Holotype ♂, TASMANIA (MNHN, Paris) [examined]. **Comb. n.** – TASM.

Genus *PILIMYIA* Malloch

*Pilimyia* Malloch, 1930b : 329. Type-species: *Pilimyia lasiophthalma* Malloch, 1930, by original designation.

***lasiophthalma*** Malloch, 1930b : 329. Holotype ♂, NEW SOUTH WALES: Blue Mts (SPHTM, Sydney) [examined]. — N.S.W.

***lateralis*** Macquart, 1846 : 293 (165) (*Phorocera*). Lectotype ♂ (by designation of Crosskey, 1971 : 282), 'TASMANIA' (MNHN, Paris) [examined]. **Comb. n.** — TASM. (?).

Genus *TRIGONOSPILA* Pokorný

*Trigonospila* Pokorný, 1886 : 191. Type-species: *Trigonospila picta* Pokorný, 1886 [= *Tachina ludio* Zetterstedt, 1848], by monotypy. (EUROPE).

*Zosteromyia* Brauer & Bergenstamm, 1891 : 376 (72). Type-species: *Myobia cingulata* Macquart sensu Brauer & Bergenstamm (misidentification) [= *Zosteromyia braueri* Townsend, 1933], by original designation. (Note: Townsend's belief that Brauer & Bergenstamm misidentified *cingulata* Macquart needs confirmation.)

*Zosteromyiopsis* Townsend, 1933 : 456. Type-species: *Myobia cingulata* Macquart, 1851, by original designation.

***braueri*** Townsend, 1933 : 457 (*Zosteromyia*). Holotype ♂, TASMANIA (NM, Vienna). **Comb. n.** — QLD, TASM.

***brevifacies*** Hardy, 1934 : 36 (*Zosteromyia*). Lectotype ♀ (by present designation), NEW SOUTH WALES: Tooloom (QM, Brisbane) [examined]. **Comb. n.** — N.S.W., TASM. (Possibly = *braueri*).

***cingulata*** Macquart, 1851 : 179 (206) (*Myobia*). Lectotype ♂ (by designation of Crosskey, 1971 : 279), TASMANIA (MNHN, Paris) [examined]. — N.S.W., QLD, TASM., VICT.

***fasciata*** Hardy, 1934 : 35 (*Zosteromyia*). Syntypes ♂, ♀, TASMANIA: Hobart, Mt Wellington & VICTORIA: Melbourne (not located). **Comb. n.** — TASM., VICT.

The generic position requires confirmation when type-material located.

Genus *ZENARGOMYIA* Crosskey

*Zenargomyia* Crosskey, 1964 : 18. Type-species: *Zenargomyia moorei* Crosskey, 1964, by original designation.

***moorei*** Crosskey, 1964 : 20. Holotype ♂, NEW SOUTH WALES: Matong S.F. (AM, Sydney) [examined]. — N.S.W.

Genus *ZOSTEROMEIGENIA* Townsend

*Zosteromeigenia* Townsend, 1919a : 579. Type-species: *Zosteromeigenia mima* Townsend, 1919, by original designation.

***mima*** Townsend, 1919a : 579. Holotype ♂, QUEENSLAND: Hamilton, Upper North Pine (USNM, Washington) [examined]. — QLD.

***longicornis*** Hardy, 1934 : 36 (*Zosteromyia*). Lectotype ♂ (by present designation), QUEENSLAND: Mt. Glorious (UQ, Brisbane) [examined]. **Syn. n.**

Unplaced species of *Blondeliini*

***minor*** Hardy, 1934 : 36 (*Zosteromyia*). Syntypes ♂, TASMANIA: Strahan (not located). — TASM.

**similis** Macquart, 1851 : 167 (194) (*Masicera*). Holotype ♀, 'TASMANIA' (MNHN, Paris) [examined]. — TASM. (?).

Holotype of this species is in dreadful condition but is apparently a *Blondeline*. The prosternum is haired and the parafacials fully haired.

### Tribe EXORISTINI Robineau-Desvoidy

EXORISTIDAE Robineau-Desvoidy, 1863 (1) : 244. Type-genus: *Exorista* Meigen, 1803.

### Genus AUSTROPHOROCERA Townsend

*Austrophorocera* Townsend, 1916c : 157. Type-species: *Phorocera biserialis* Macquart, 1847, by original designation

*Glossosalia* Mesnil, 1947 : 62 (as subg. of *Spoggosia* Rondani). [Unavailable: no fixation of a type-species from two included species.]

*Glossosalia* Mesnil, 1960 : 606 (as subg. of *Spoggosia* Rondani). Type-species: *Phorocera grandis* Macquart, 1851, by original designation.

**biserialis** Macquart, 1847 : 89 (73) (*Phorocera*). Lectotype ♂ (by fixation of Townsend, 1940 : 158), TASMANIA (BMNH, London) [examined]. — TASM., VICT.

**grandis** Macquart, 1851 : 171 (198) (*Phorocera*). Holotype ♂, AUSTRALIA (MNHN, Paris) [examined]. — N.S.W., S.A., QLD; NEW GUINEA; ORIENTAL REGION.

Undetermined sp. — N.S.W.

### Genus CHAETORIA Becker

*Chaetoria* Becker, 1908 : 113. Type-species: *Chaetoria stylata* Becker, 1908, by monotypy. (CANARY ISLANDS).

*Vorina* Malloch, 1930b : 321. Type-species: *Vorina setibasis* Malloch, 1930, by original designation.

**setibasis** Malloch, 1930b : 321 (*Vorina*). Holotype ♀, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. — N.S.W.

### Genus EOZENILLIA Townsend

*Eozenillia* Townsend, 1926c : 542. Type-species: *Eozenillia equatorialis* Townsend, 1926, by original designation. (SINGAPORE).

**remota** Walker, 1852 : 280 (*Tachina*). Holotype ♀, NEW SOUTH WALES (BMNH, London) [examined]. **Comb. n.** — N.S.W., S.A.

**flavipalpis** Macquart, 1855 : 122 (102) (*Phorocera*). Holotype ♀ [not ♂], NEW SOUTH WALES: Sydney (BMNH, London) [examined].

### Genus EXORISTA Meigen

*Exorista* Meigen, 1803 : 280. Type-species: *Musca larvarum* Linnaeus, 1758, by monotypy. (EUROPE).

*Thrycolyga* Rondani, 1856 : 68. Type-species: *Thrycolyga nova* Rondani, 1856, by original designation. (ITALY).

*Eutachina* Brauer & Bergenstamm, 1889 : 98 (30). Type-species: *Musca larvarum* Linnaeus, 1758, by monotypy. (EUROPE). [Junior objective synonym of *Exorista*.]

*Podotachina* Brauer & Bergenstamm, 1891 : 350 (46). Type-species: *Tachina sorbillans* Wiedemann, 1830, by subsequent designation of Townsend (1916a : 8). (CANARY ISLANDS).

*Tricholyga*. Incorrect subsequent spelling of *Thrycolyga* Rondani.

[*Tachina* Meigen sensu authors (misidentification)]

***auriceps*** Macquart, 1851 : 158 (185). Holotype ♂, [TASMANIA: publ. as Oceania] (MNHN, Paris) [examined]. – TASM. (Probably = *flaviceps*).

Mesnil (1960 : 578) placed *auriceps* (with the wrongly cited date 1849) as a synonym of *sorbillans* (Wiedemann) and Herting (1962 : 80) wrote that 'Die Type von *sorbillans* Wied. aus Teneriffa . . . ist mit *auriceps* Macq. identisch'. Though *auriceps* undoubtedly belongs to the *sorbillans* complex it is here considered insufficiently substantiated that *auriceps* is synonymous with *sorbillans* s. str. (particularly as the male genitalia of *auriceps* holotype have never been examined) and the name *auriceps* is here maintained as valid pending further study.

***coras*** Walker, 1849 : 785 (*Tachina*). Holotype ♂ [abdomen lost], WESTERN AUSTRALIA: Perth (BMNH, London) [examined]. – N.S.W., W.A.

***curriei*** Curran, 1938 : 197 (*Thrycolyga*). Holotype ♂, QUEENSLAND: Lawnton (BMNH, London) [examined]. – QLD.

***doddi*** Curran, 1938 : 201 (*Zenillia*). Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde) [examined]. – QLD.

***flaviceps*** Macquart, 1847 : 83 (67). Holotype ♂, TASMANIA (BMNH, London) [examined]. – N.S.W., S.A., TASM., VICT.

*consanguinea* Macquart, 1851 : 167 (194) (*Masicera*). Holotype ♂, [TASMANIA: publ. as Oceania] (MNHN, Paris) [examined]. **Syn. n.**

***mungomeryi*** Baranov, 1938b : 410 (*Eutachina*). Lectotype ♂ (by designation of Sabrosky & Crosskey, 1969 : 43), QUEENSLAND: Gordonvale (BMNH, London) [examined]. – QLD.

***psychidivora*** Coquillett, 1904 : 137 (*Tachina*). Holotype ♂, WESTERN AUSTRALIA (USNM, Washington) [examined]. – W.A.

***sorbillans*** Wiedemann, 1830 : 311 (*Tachina*). Lectotype ♂ (by fixation of Townsend, 1932 : 45), CANARY ISLANDS: Teneriffe (NM, Vienna). – QLD; NEW GUINEA; widespread S. PALAE-ARCTIC, ORIENTAL, ETHIOPIAN REGIONS.

This species was described from at least two syntypes, as Wiedemann stated 'In v. Winthem's und meiner Sammlung'. There are no surviving specimens in Wiedemann's collection, but an original syntype exists in von Winthem's collection (Vienna). This specimen was cited by Townsend (1932 : 45) as 'male Ht [=holotype] in Wien, labelled "Teneriffa : Coll Winthem"', who thus provided a valid fixation of the specimen as lectotype. The lectotype was not available during the preparation of the present work, but has been examined by Herting (1962 : 80).

Confirmation is needed that Queensland specimens are truly conspecific with the lectotype.

***tristis*** Curran, 1938 : 203 (*Zenillia*). Holotype ♀, QUEENSLAND: Cairns (DEI, Eberswalde) [examined]. – QLD.

### Genus *HILLOMYIA* Crosskey **nom. n.**

*Hillia* Malloch, 1929b : 328. Type-species: *Hillia polita* Malloch, 1929, by original designation. [Junior homonym of *Hillia* Grote, 1883.]

*Hillomyia* Crosskey **nom. n.** [New name for *Hillia* Malloch.]

***polita*** Malloch, 1929b : 328. Holotype ♀, NORTHERN TERRITORY: Darwin (ANIC, Canberra) [examined]. **Comb. n.** – N.T.

### Genus *SPOGGOSIA* Rondani\*

*Spoggosia* Rondani, 1859 : 182. Type-species: *Spoggosia occlusa* Rondani, 1859 [= *Salia echinura* Robineau-Desvoidy, 1830], by monotypy. (EUROPE).

\* See Appendix, p. 209.

**micropalpis** Malloch, 1930b : 321 (*Stomatomyia*). Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – A.C.T., N.S.W., TASM., VICT.  
Undescribed sp. – N.S.W.

### Genus *STOMATOMYIA* Brauer & Bergenstamm

- Stomatomyia* Brauer & Bergenstamm, 1889 : 98 (30). Type-species: *Chetogena filipalpis* Rondani, 1859, by monotypy. (ITALY).  
*Plagiprospherysa* Townsend, 1892a : 113. Type-species: *Plagiprospherysa valida* Townsend, 1892 [= *Prospheysa parvipalpis* Wulp, 1890], by original designation. (NORTH AMERICA).  
**acuminata** Rondani, 1859 : 180 (*Chetogena*). Syntypes [? sex], ITALY (MZ, Florence). – N.S.W. QLD, W.A. (vide Malloch, 1930b : 320); S. PALAEARCTIC REG., JAPAN; ORIENTAL REG. including INDONESIA.  
**tricholygoides** Bezzi, 1928 : 205. Holotype ♂, FIJI: Ovalau (BMNH, London) [examined]. – N.S.W., QLD (?); FIJI, NEW GUINEA, SOLOMONS.

### Tribe *ETHILLINI* Mesnil

ETHYLLINA [sic] Mesnil, 1944 : 23. Type-genus: *Ethilla* Robineau-Desvoidy, 1863.

### Genus *ETHILLA* Robineau-Desvoidy

- Ethilla* Robineau-Desvoidy, 1863 : 202. Type-species: *Tachina aemula* Meigen, 1824, by original designation. (EUROPE).  
*Ethylla*. Incorrect subsequent spelling of *Ethilla* Robineau-Desvoidy.  
**translucens** Macquart, 1851 : 162 (189) (*Exorista*). Holotype ♂, TASMANIA (MNHN, Paris) [examined]. **Comb. n.** – S.A., TASM., VICT.

### Genus *PHOROCEROSOMA* Townsend

- Phorocerosoma* Townsend, 1927a : 61. Type-species: *Phorocerosoma forte* Townsend, 1927 [= *Masicera vicaria* Walker, 1847], by original designation. (SUMATRA).  
**cilipes** Macquart, 1847 : 88 (72) (*Phorocera*). Holotype ♂, TASMANIA (BMNH, London) [examined]. **Comb. n.** – TASM.  
**rufomaculata** Macquart, 1851 : 160 (187) (*Exorista*). Holotype ♂, TASMANIA (MNHN, Paris) [examined]. **Syn. n.**  
This species is certainly an ethilline, but there are some differences from *Phorocerosoma* and inclusion in this genus is an interim measure.  
**postulans** Walker, 1861a : 240 (*Nemoraea*). Holotype ♂ [head lost], NEW GUINEA: Dorey (BMNH, London) [examined]. – N.T., QLD; NEW GUINEA; SOLOMONS; widespread ORIENTAL REGION and tropical AFRICA.  
**mysolana** Walker, 1864 : 213 (*Masicera*). Holotype ♀, INDONESIA: Moluccas, Misoöl (publ. as Mysol) (BMNH, London) [examined].  
**anomala** Baranov, 1936 : 99. Lectotype ♀ (by designation of Crosskey, 1966b : 108), FORMOSA: Koshun, Kankau (DEI, Eberswalde) [examined].  
**nitidicauda** Curran, 1938 : 202 (*Zenillia*). Holotype ♂, QUEENSLAND: Cairns (SPHTM, Sydney) [examined].

Genus **MYCTEROMYIELLA** Mesnil

*Mycteromyia* Mesnil, 1950a : 107. Type-species: *Mycteromyia laetifica* Mesnil, 1950, by original designation. (NEW GUINEA). [Junior homonym of *Mycteromyia* Philippi, 1865.]

*Mycteromyiella* Mesnil, 1965 : 232. [Replacement name for *Mycteromyia* Mesnil.]

Undescribed sp. – N.S.W.

Tribe **WINTHEMIINI** Townsend

WINTHEMIAE Townsend, 1913 : 52. Type-genus: *Winthemia* Robineau-Desvoidy, 1830.

Genus **CRYPsINA** Brauer & Bergenstamm

*Crypsina* Brauer & Bergenstamm, 1889 : 97 (29). Type-species: *Crypsina prima* Brauer & Bergenstamm, 1889, by original designation and monotypy.

*Amplipila* Curran, 1927c : 446. Type-species: *Amplipila versicolor* Curran, 1927 [= *Crypsina prima* Brauer & Bergenstamm, 1889], by original designation.

**prima** Brauer & Bergenstamm, 1889 : 97 (29). Holotype ♀, QUEENSLAND: Rockhampton (NM, Vienna) [examined]. – QLD.

*versicolor* Curran, 1927c : 446 (*Amplipila*). Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde) [examined].

Genus **NEMORILLA** Rondani

*Nemorilla* Rondani, 1856 : 66. Type-species: *Tachina maculosa* Meigen, 1824, by original designation. (EUROPE).

Undetermined sp. – QLD. (The mis-associated ♀ paralectotype of *Sisyropa cinerea* Brauer & Bergenstamm from Cape York is a specimen of *Nemorilla* but the species has not been determined).

Genus **WINTHEMIA** Robineau-Desvoidy

*Winthemia* Robineau-Desvoidy, 1830 : 173. Type-species: *Tachina variegata* Meigen, 1824, by subsequent designation of Robineau-Desvoidy (1863 : 207). (EUROPE).

*Pseudokea* Townsend, 1928 : 393. Type-species: *Pseudokea neowinthemioides* Townsend, 1928, by original designation. (PHILIPPINES).

*Winthemya*. Incorrect subsequent spelling of *Winthemia* Robineau-Desvoidy.

**lateralis** Macquart, 1843 : 215 (58) (*Eurigaster*). Holotype ♂, AUSTRALIA (MNHN, Paris) [examined]. – N.S.W., S.A., TASM.

**brevisetosa** Macquart, 1846 : 282 (154) (*Nemoraeta*). Holotype ♂, TASMANIA (MNHN, Paris) [examined]. **Syn. n.**

**lata** Macquart, 1848 : 207 (47) (*Exorista*). Holotype ♂, AUSTRALIA (BMNH, London) [examined]. **Syn. n.**

**marginata** Macquart, 1851 : 161 (188) (*Exorista*). Lectotype ♂ (by designation of Crosskey, 1971 : 269), TASMANIA (MNHN, Paris) [examined]. **Syn. n.**

**albiceps** Malloch, 1930b : 349. Holotype ♂, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. **Syn. n.**

**albicans**. Incorrect multiple original spelling of *albiceps* Malloch.

**neowinthemioides** Townsend, 1928 : 394 (*Pseudokea*). Holotype ♂, PHILIPPINES: Mindanao, Cagayan (USNM, Washington) [examined]. – N.S.W., QLD, NEW GUINEA, PHILIPPINES, INDONESIA.

**diversa** Malloch, 1930b : 348. Holotype ♂, NEW SOUTH WALES: Killara, Allowrie (SPHTM, Sydney) [examined]. **Syn. n.**

**trichopareia** Schiner, 1868 : 327 (*Exorista*). Type(s) [? sex], [AUSTRALIA] (not located, possibly lost). — QLD. (Confirmation of identity required).

This species was, as Malloch (1930b : 349) stated, unsatisfactorily described by Schiner who did not state the number of specimens, or their sex or their locality of origin. Nothing in the description indicates positively that *Winthemia* is the correct genus, and Malloch's (1930b) placement was made by guesswork from Brauer & Bergenstamm's (1891 : 441) earlier placement in *Chaetolyga*; it is from their statement of 'Australien' that the provenance of Schiner's species is known. The original type-material has never been studied and cannot now be found amongst Schiner's types in NM, Vienna.

### Tribe CARCELIINI Townsend

CARCELIINAE Townsend, 1913 : 52. Type-genus: *Carcelia* Robineau-Desvoidy, 1830.

#### Genus ARGYROPHYLAX Brauer & Bergenstamm

*Argyrophylax* Brauer & Bergenstamm, 1889 : 163 (95). Type-species: *Tachina albincisa* Wiedemann, 1830, by original designation and monotypy. (WEST INDIES).

**solomonica** Baranov, 1938a : 170 (*Bactromyia*, as subsp. of *fransseni* Baranov). Lectotype ♂ (by designation of Sabrosky & Crosskey, 1969 : 36), SOLOMON ISLANDS: Russell Is. (BMNH, London) [examined]. — QLD; NEW GUINEA, SOLOMONS.

#### Genus ARGYROTHELAIRA Townsend

*Argyrothelaira* Townsend, 1916a : 311. Type-species: *Argyrothelaira froggattii* Townsend, 1916, by original designation. (SOLOMON ISLANDS).

**melancholica** Mesnil, 1944 : 29 (*Carcelia*). Holotype ♀ [head and most legs lost], QUEENSLAND: Cairns (DEI, Eberswalde) [examined]. **Comb. n.** — QLD; NEW GUINEA.

#### Genus CARCELIA Robineau-Desvoidy

*Carcelia* Robineau-Desvoidy, 1830 : 176. Type-species: *Carcelia bombylans* Robineau-Desvoidy, 1830, by subsequent designation of Townsend (1916a : 6). (EUROPE).

#### Subgenus CARCELIA Robineau-Desvoidy

*Carcelia* Robineau-Desvoidy, 1830 : 176. Type-species: *Carcelia bombylans* Robineau-Desvoidy, 1830, by subsequent designation of Townsend (1916a : 6). (EUROPE).

**hardyi** Curran, 1938 : 200 (*Zenillia*). Holotype ♂, QUEENSLAND: Brisbane (SPHMT, Sydney) [examined]. — QLD, VICT. (?).

**tasmanica** Robineau-Desvoidy, 1863 : 240. Holotype ♂, TASMANIA (lost). — TASM.  
*scutellaris* Robineau-Desvoidy, 1863 : 240 (*Phorocera*). [Unavailable name, first published as a synonym.]

Robineau-Desvoidy named *C. tasmanica* for a male specimen said by him to be in the Paris Museum and to be labelled 'Phorocera scutellaris' by Macquart. Macquart did not publish this name, but it was cited by Robineau-Desvoidy in synonymy with *tasmanica*. The name *scutellaris* is therefore attributable to Robineau-Desvoidy and is unavailable under Article 11(d) of the ICZN. The type-specimen cannot be found in MNHN, Paris, and is presumed lost.

Subgenus **SENOMETOPIA** Macquart

*Senometopia* Macquart, 1834 : 296 (as genus). Type-species: *Carcelia aurifrons* Robineau-Desvoidy, 1830 [= *Tachina excisa* Fallén, 1820], by subsequent designation of Townsend (1916a : 8). (EUROPE).

*Stenometopia* Agassiz, 1846 : 351. Unjustified emendation of *Senometopia* Macquart.

*Eocarcelia* Townsend, 1919a : 582. Type-species: *Eocarcelia ceylanica* Townsend, 1919, by original designation. (CEYLON). **Syn. n.**

*Eocarceliopsis* Townsend, 1928 : 392. Type-species: *Eocarceliopsis bakeri* Townsend, 1928, by original designation. (PHILIPPINES). **Syn. n.**

*Eucarcelia* Baranov, 1934b : 393. Type-species: *Tachina excisa* Fallén, 1820, by original designation. (EUROPE).

*Dicephalomyia* Malloch, 1935 : 337. Type-species: *Dicephalomyia rufiventris* Malloch, 1935, by original designation. (BORNEO). **Syn. n.**

**cinerea** Brauer & Bergenstamm, 1891 : 346 (42) (*Sisyropa*). Lectotype ♂ (by present designation), QUEENSLAND: Rockhampton (NM, Vienna) [examined]. – QLD; NEW GUINEA.

**cosmophilae** Curran, 1938 : 200 (*Zenillia*). Holotype ♂, QUEENSLAND (BMNH, London) [examined]. – QLD.

**murina** Curran, 1938 : 198 (*Zenillia*). Holotype ♂, NEW SOUTH WALES: Wee Waa (BMNH, London) [examined]. – N.S.W., QLD.

**noctuae** Curran, 1938 : 199 (*Zenillia*). Holotype ♂, QUEENSLAND: Lawnton (BMNH, London) [examined]. – QLD. (Possibly = *illota* Curran, 1927, of Ethiopian Region).

Genus **CARCELIMYIA** Mesnil

*Carcelimyia* Mesnil, 1944 : 26. Type-species: *Exorista dispar* Macquart, 1851, by original designation.

**dispar** Macquart, 1851 : 159 (186) (*Exorista*). Lectotype ♂ (by designation of Crosskey, 1971 : 268), AUSTRALIA (MNHN, Paris) [examined]. – N.S.W., N.T., W.A.

Tribe **ANACAMPTOMYIINI** Townsend

ANACAMPTOMYIINI Townsend, 1936 : 35, 38, 41. Type-genus: *Anacamptomyia* Bischof, 1904.

Genus **ANACAMPTOMYIA** Bischof

*Anacamptomyia* Bischof, 1904 : 79. Type-species: *Anacamptomyia africana* Bischof, 1904, by monotypy. (SOUTH AFRICA).

*Vespihora* Malloch, 1930b : 347. Type-species: *Vespihora nigriventris* Malloch, 1930, by original designation.

**nigriventris** Malloch, 1930b : 347 (*Vespihora*). Holotype ♂, QUEENSLAND: Eidsvold (ANIC, Canberra) [examined]. – N.S.W., QLD.

Genus **EUVESPIVORA** Baranov

*Euvespihora* Baranov, 1942 : 161. Type-species: *Euvespihora orientalis* Baranov, 1942, by original designation. (JAVA).

*Xenosturmia* Mesnil, 1944 : 26. Type-species: *Xenosturmia testaceipes* Mesnil, 1944 [= *Eurygaster decipiens* Walker, 1859], by original designation. (NEW BRITAIN).

- decipiens** Walker, 1859 : 100 (*Eurygaster*). Holotype ♀, ARU ISLANDS (BMNH, London) [examined] – N.S.W., QLD; MALAYA, ARU ISLANDS, SOLOMONS, NEW CALEDONIA.  
**salomonica** Baranov, 1942 : 163. Holotype ♀, SOLOMON ISLANDS: Tulagi (BMNH, London) [examined].  
**testaceipes** Mesnil, 1944 : 26 (*Xenosturmia*). Holotype ♀, NEW BRITAIN: Kinigunang (DEI, Eberswalde) [examined].

### Genus **KORALLIOMYIA** Mesnil

- Koralliomyia* Mesnil, 1950a : 114. Type-species: *Koralliomyia portentosa* Mesnil, 1950, by original designation. (INDIA).  
 Undetermined spp. (possibly *portentosa* Mesnil). – QLD.

### Tribe **STURMIINI** Robineau-Desvoidy

- STURMIDAE Robineau-Desvoidy, 1863 (1) : 885. Type-genus: *Sturmia* Robineau-Desvoidy, 1830.

### Genus **ANAMASTAX** Brauer & Bergenstamm

- Anamastax* Brauer & Bergenstamm, 1891 : 349 (45). Type-species: *Blepharipeza goniaeformis* Macquart sensu Brauer & Bergenstamm (misidentification) [= *Anamastax australis* Townsend, 1933], by original designation.

- braueri** Hardy, 1938 : 62 (*Tritaxys*, as replacement name for *australis* Townsend). – N.S.W., QLD.

*australis* Townsend, 1933 : 473. Holotype ♂, QUEENSLAND (NM, Vienna).

Hardy (1938 : 59) treated *Anamastax* as a synonym of *Tritaxys*, thereby bringing *A. australis* Townsend into the same genus as *T. australis* Macquart. He therefore published the replacement name *braueri* for the secondarily homonymous *australis* Townsend. Regrettably, as this change was made prior to 1960, the name *braueri* stands valid for the species under the present ICZN even though the species involved are no longer considered congeneric.

Undescribed sp. – N.S.W.

### Genus **ARRHENOMYZA** Malloch

- Arrhenomyza* Malloch, 1929b : 322. Type-species: *Arrhenomyza conspicua* Malloch, 1929, by original designation.

- conspicua** Malloch, 1929b : 322. Holotype ♂, WESTERN AUSTRALIA: Eradu, near Geraldton (ANIC, Canberra) [examined]. – W.A.

### Genus **BLEPHARELLA** Macquart

- Blepharella* Macquart, 1851 : 176 (203). Type-species: *Blepharella lateralis* Macquart, 1851, by monotypy. (INDIA).

- Podomyia* Brauer & Bergenstamm, 1889 : 96 (28). Type-species: *Eurigaster setosa* Doleschall, 1858 [= *Blepharella lateralis* Macquart, 1851], by original designation. (AMBOYNA).

- Phryxosturmia* Townsend, 1927a : 68. Type-species: *Phryxosturmia jacobsoni* Townsend, 1927 [= *Blepharella lateralis* Macquart, 1851], by original designation. (SUMATRA).

- Apilia* Malloch, 1930b : 345. Type-species: *Apilia cilifera* Malloch, 1930 [= *Blepharella lateralis* Macquart, 1851], by original designation.

- lateralis** Macquart, 1851 : 177 (204). Holotype ♂, INDIA: Pondicherry (MNHN, Paris) [examined]. – QLD; NEW GUINEA, SOLOMONS, widespread ORIENTAL REGION.
- maculata** Macquart, 1851 : 173 (200) (*Phorocera*). Holotype ♂, AUSTRALIA (MNHN, Paris) [examined]. **Syn. n.**
- ciliifera** Malloch, 1930b : 345 (*Apilia*). Holotype ♂, QUEENSLAND: Eidsvold (ANIC, Canberra) [examined].
- (For other synonyms, based on Oriental types, see Crosskey, 1966b : 106)

### Genus *BLEPHARIPA* Rondani

- Blepharipa* Rondani, 1856 : 71. Type-species: *Senometopia ciliata* Macquart, 1835 [= *Nemoraëa scutellata* Robineau-Desvoidy, 1830], by original designation. (FRANCE).
- Verreauxia* Robineau-Desvoidy, 1863 : 893. Type-species: *Verreauxia auripilis* Robineau-Desvoidy, 1863, by original designation. [Junior homonym of *Verreauxia* Hartlaub, 1856.]
- Ugimyia* Rondani, 1870 : 137. Type-species: *Ugimyia sericariae* Rondani, 1870, by monotypy. (JAPAN).
- Blepharipoda* Brauer & Bergenstamm, 1889 : 96 (28). Type-species: *Nemoraëa scutellata* Robineau-Desvoidy, 1830, by monotypy. (FRANCE). [Junior homonym of *Blepharipoda* Randall, 1840].
- Crossocosmia* Mik, 1890 : 313. Type-species: *Ugimyia sericariae* Rondani, 1870 (as *sericariae* Cornalia), by original designation. [Junior objective synonym of *Ugimyia* Rondani.] (JAPAN).
- Eoparachaeta* Townsend, 1927a : 70. Type-species: *Eoparachaeta orientalis* Townsend, 1927 [= *Tachina zebina* Walker, 1849], by original designation. (SUMATRA).
- Sumatrosturmia* Townsend, 1927a : 70. Type-species: *Sumatrosturmia orbitalis* Townsend, 1927, by original designation. (SUMATRA).
- Indosturmia* Townsend, 1932 : 49. Type-species: *Crossocosmia indica* Brauer & Bergenstamm, 1893, by original designation. (INDIA).
- Chrysopygia* Townsend, 1933 : 471. Type-species: *Chrysopygia auricaudata* Townsend, 1933, by original designation. (JAVA).
- auripilis** Robineau-Desvoidy, 1863 : 894 (*Verreauxia*). Holotype ♂, TASMANIA (lost). **Comb. n.** – TASM., N.S.W. (?).
- coesiofasciata** Macquart, 1851 : 165 (192) (*Masicera*). Holotype ♀, AUSTRALIA (MNHN, Paris) [examined]. **Comb. n.** – N.S.W.
- fulviventris** Macquart, 1851 : 165 (192) (*Masicera*). Lectotype ♂ (by designation of Crosskey, 1971 : 274), 'TASMANIA' (MNHN, Paris) [examined]. **Comb. n.** – N.S.W., QLD, TASM. (?). (Possibly = *sugens* Wiedemann of Oriental Region)
- australis** Walker, 1852 : 279 (*Tachina*). Holotype ♂, NEW SOUTH WALES (BMNH, London) [examined]. **Syn. n.**

### Genus *CALOZENILLIA* Townsend

- Calozenillia* Townsend, 1927a : 67. Type-species: *Calozenillia auronigra* Townsend, 1927, by original designation. (SUMATRA).
- olm** Walker, 1849 : 775 (*Tachina*). Holotype ♀, AUSTRALIA (BMNH, London) [examined]. – QLD.
- picta** Curran, 1938 : 202 (*Zenillia*). Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde) [examined]. – QLD.

### Genus *EURYGASTROPSIS* Townsend

- Eurygastropsis* Townsend, 1916c : 158. Type-species: *Eurigaster tasmaniae* Walker, 1858, by original designation.

*Calopygidia* Malloch, 1930b : 349. Type-species: *Calopygidia analis* Malloch, 1930 [= *Eurigaster tasmaniae* Walker, 1858], by original designation.

***tasmaniae*** Walker, 1858 : 197 (*Eurigaster*). Holotype ♂ [not ♀], TASMANIA (BMNH, London) [examined]. — N.S.W., QLD, TASM., W.A.; NEW GUINEA (?).

*analis* Malloch, 1930b : 350 (*Calopygidia*). Holotype ♂, NEW SOUTH WALES: Barrington Tops (ANIC, Canberra) [examined].

### Genus **PALEXORISTA** Townsend

*Palexorista* Townsend, 1921 : 134. Type-species: *Tachina succini* Giebel, 1862 [= *Masicera solennis* Walker, 1859], by original designation. (Presumed ORIENTAL: *succini* based on holotype in copal, see Crosskey, 1966c : 133).

*Sumatrodoria* Townsend, 1927a : 64. Type-species: *Sumatrodoria summaria* Townsend, 1927, by original designation. (SUMATRA).

*Prosturmia* Townsend, 1927a : 69. Type-species: *Prosturmia profana* Townsend, 1927 [= *Masicera solennis* Walker, 1859], by original designation. (SUMATRA).

***bancrofti*** Crosskey, 1967c : 85. Holotype ♂, QUEENSLAND: Burpengary (ANIC, Canberra) [examined]. — QLD.

***curvipalpis*** Wulp, 1893 : 162 (*Crossocosmia*). Lectotype ♂ (by designation of Crosskey, 1967c : 68), JAVA (RMNH, Leiden) [examined]. — QLD; NEW GUINEA, SOLOMONS, widespread ORIENTAL REGION.

*uniseta* Baranov, 1932 : 75 (*Sturmia*). Lectotype ♂ (by designation of Crosskey, 1967c : 68), FORMOSA: Kankau, Koshun (DEI, Eberswalde) [examined].

***lucagus*** Walker, 1849 : 678 (*Tachina*). Holotype ♂, CHINA: Foo-chow-foo (BMNH, London) [examined]. — N.T.; NEW GUINEA; widespread ORIENTAL REGION.

***macquarti*** Crosskey **nom. n.** [Replacement name for *Masicera auriceps* Macquart, 1851.]

*auriceps* Macquart, 1851 : 168 (195) (*Masicera*). Lectotype ♀ (by designation of Crosskey, 1971 : 273), 'TASMANIA' (MNHN, Paris) [examined]. [Junior primary homonym of *Masicera auriceps* Macquart, 1843.]

***solennis*** Walker, 1859 : 98 (*Masicera*). Holotype ♂ [not ♀], ARU ISLANDS (BMNH, London) [examined]. — QLD; widespread ORIENTAL REGION, MELANESIA and MICRONESIA; TONGA.

*profana* Townsend, 1927a : 69 (*Prosturmia*). Lectotype ♂ (by designation of Crosskey, 1969 : 100), SUMATRA: Fort de Kock (ZM, Amsterdam) [examined].

*inconspicue* Baranov, 1932 : 79 (*Sturmia*). Lectotype ♂ (by designation of Crosskey, 1967c : 57), FORMOSA: Kankau, Koshun (DEI, Eberswalde) [examined].

(For further synonymy see Crosskey, 1967c : 57.)

***sororcula*** Mesnil, 1949b : 30 (*Drino*). Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde) [examined]. — QLD.

***subanajama*** Townsend, 1927a : 69 (*Prosturmia*). Lectotype ♂ (by designation of Crosskey, 1967c : 55), SUMATRA: Suban Ajam (ZM, Amsterdam) [examined]. — QLD; NEW GUINEA, SOLOMONS, MALAYSIA, INDONESIA.

### Genus **PALIA** Curran

*Palia* Curran, 1927c : 443. Type-species: *Palia aureocauda* Curran, 1927, by original designation.

***aureocauda*** Curran, 1927c : 444. Holotype ♂, QUEENSLAND: Kuranda (DEI, Eberswalde) [examined]. — QLD.

### Genus **PALIANA** Curran

*Paliana* Curran, 1927c : 445. Type-species: *Paliana basalis* Curran, 1927, by original designation.

- basalis** Curran, 1927c : 445. Holotype ♂, QUEENSLAND: Kuranda (DEI, Eberswalde) [examined]. – QLD.
- intensa** Curran, 1927c : 446. Holotype ♀, QUEENSLAND: Kuranda (DEI, Eberswalde) [examined]. – QLD. (Probably = *basalis*)

### Genus *PARADRINO* Mesnil

- Paradrino* Mesnil, 1949b : 8, 35 (as subg. of *Drino* Robineau-Desvoidy). Type-species: *Sturmia halli* Curran, 1939, by monotypy. (AFRICA).
- laevicula** Mesnil, 1951 : 197 (*Drino*). Holotype ♀, FORMOSA: Kankau, Koshun (DEI, Eberswalde) [examined]. – QLD; NEW GUINEA; widespread ORIENTAL REGION.

### Genus *PARAGONIA* Mesnil

- Paragonia* Mesnil, 1950a : 106. Type-species: *Paragonia portentosa* Mesnil, 1950, by original designation.
- portentosa** Mesnil, 1950a : 106. Holotype ♂, WESTERN AUSTRALIA: Waroona (CNC, Ottawa, ex coll. Mesnil) [examined]. – W.A.

### Genus *POLYCHAETA* Macquart

- Polychaeta* Macquart, 1851 : 154 (181). Type-species: *Polychaeta nigra* Macquart, 1851, by monotypy.
- nigra** Macquart, 1851 : 154 (181). Holotype ♀, 'TASMANIA' (MNHN, Paris) [examined]. – A.C.T., N.S.W., TASM. (?).
- subpubescens** Macquart, 1851 : 172 (199) (*Phorocera*). Holotype ♀ [not ♂], 'TASMANIA' (MNHN, Paris) [examined]. **Syn. n.**

### Genus *QUADRA* Malloch

- Quadra* Malloch, 1929b : 320. Type-species: *Quadra ornata* Malloch, 1929, by original designation.
- ornata** Malloch, 1929b : 320. Holotype ♀, WESTERN AUSTRALIA: King George's Sound (AM, Sydney) [examined]. – W.A.

### Genus *SISYROPA* Brauer & Bergenstamm

- Sisyropa* Brauer & Bergenstamm, 1889 : 163 (95). Type-species: *Tachina thermophila* Wiedemann, 1830, by original designation. (JAVA).
- taylori** Curran, 1938 : 204 (*Zenillia*). Holotype ♂, QUEENSLAND: Innisfail (SPHTM, Sydney) [examined]. – N.T., QLD; NEW GUINEA, MOLUCCAS.
- Undetermined spp. (with bare eyes). – QLD.

### Genus *STURMIA* Robineau-Desvoidy

- Sturmia* Robineau-Desvoidy, 1830 : 171. Type-species: *Sturmia vanessae* Robineau-Desvoidy, 1830 [= *Tachina bella* Meigen, 1824], by subsequent designation of Robineau-Desvoidy (1863 : 888).

- convergens** Wiedemann, 1824 : 43 (*Tachina*). Lectotype ♀ (by designation of Crosskey, 1963 : 78), INDIA (UZM, Copenhagen) [examined]. – N.S.W., QLD; NEW GUINEA; wide-spread ORIENTAL REGION.
- setilatera* Wiedemann, 1830 : 321 (*Tachina*). Lectotype ♂ (by designation of Crosskey, 1966a : 678), 'IND. OR.' (probably = INDIA) (UZM, Copenhagen) [examined].
- Undetermined sp. – S.A.

### Genus *TASMANIOMYIA* Townsend

- Chlorogaster* Macquart, 1851 : 157 (184). Type-species: *Chlorogaster tasmanensis* Macquart, 1851, by monotypy. [Junior homonym of *Chlorogaster* Swainson, 1839.]
- Tasmaniomyia* Townsend, 1916c : 152. Type-species: *Masicera viridiventris* Macquart, 1847, by original designation.
- Chlorogastrina* Crosskey, 1967 : 9. [Replacement name for *Chlorogaster* Macquart.] **Syn. n.**
- tasmanensis*** Macquart, 1851 : 157 (184) (*Chlorogaster*). Lectotype ♂ (by designation of Crosskey, 1971 : 264), 'TASMANIA' (MNHN, Paris) [examined]. **Comb. n.** – TASM. (?).
- viridiventris*** Macquart, 1847 : 84 (68) (*Masicera*). Lectotype ♂ (by fixation of Townsend, 1939 : 15), TASMANIA (BMNH, London) [examined]. – TASM.\*

### Genus *TRITAXYS* Macquart

- Tritaxys* Macquart, 1847 : 81 (65). Type-species: *Tritaxys australis* Macquart, 1847, by monotypy.
- Goniophana* Brauer & Bergenstamm, 1889 : 97 (29). Type-species: *Gonia heterocera* Macquart, 1846, by original designation.
- Gonanamastax* Townsend, 1933 : 472. Type-species: *Blepharipeza goniaeformis* Macquart, 1846, by original designation.
- Goniophania*. Incorrect subsequent spelling of *Goniophana* Brauer & Bergenstamm (Malloch, 1929a : 113, attributed to Townsend in error).
- australis*** Macquart, 1847 : 82 (66). Lectotype ♂ (by designation of Crosskey, 1971 : 292), TASMANIA (BMNH, London) [examined]. – TASM.
- goniaeformis*** Macquart, 1846 : 285 (157) (*Blepharipeza*). Lectotype ♀ (by fixation of Townsend, 1932 : 50), TASMANIA (MNHN, Paris) [examined]. – TASM. (Possibly = *heterocera*).
- heterocera*** Macquart, 1846 : 281 (153) (*Gonia*). Lectotype ♂ (by designation of Crosskey, 1971 : 269), 'TASMANIA' (MNHN, Paris) [examined]. – N.S.W., QLD, VICT., W.A., TASM. (?).
- miliars*** Walker, 1849 : 799 (*Gonia*). Holotype ♀, NEW SOUTH WALES: Hunter River (BMNH, London) [examined]. – N.S.W., QLD.
- milas*. Incorrect subsequent spelling of *miliars* Walker (Hardy, 1938 : 61).
- scutellata*** Macquart, 1846 : 293 (165) (*Phorocera*). Holotype ♂, TASMANIA (MNHN, Paris) [examined]. **Comb. n.** – TASM.

### Genus *UGIMEIGENIA* Townsend

- Ugimeigenia* Townsend, 1916d : 316. Type-species: *Ugimeigenia elzneri* Townsend, 1916, by original designation.
- elzneri*** Townsend, 1916d : 316. Holotype ♂, QUEENSLAND: Banks Island (USNM, Washington) [examined]. – QLD.

\* See Appendix, p. 209.

Genus **WINTHELLIA** Crosskey

*Thyellina* Mesnil, 1949a : 70. Type-species: *Thyellina brevicornis* Mesnil, 1949, by monotypy. [Junior homonym of *Thyellina* Agassiz, 1838.]

*Winthellia* Crosskey, 1967a : 31. [Replacement name for *Thyellina* Mesnil.]

**brevicornis** Mesnil, 1949a : 70 (*Thyellina*). Holotype ♀, QUEENSLAND: Herberton (CNC, Ottawa, ex coll. Mesnil) [examined]. – QLD.

Genus **ZEBROMYIA** Malloch

*Zebromyia* Malloch, 1929 : 321. Type-species: *Zebromyia obesa* Malloch, 1929 [= *Phorocera ornata* Macquart, 1851], by original designation.

**ornata** Macquart, 1851 : 172 (199) (*Phorocera*). Lectotype ♂ (by designation of Crosskey, 1971 : 283), TASMANIA (MNHN, Paris) [examined]. – N.S.W., TASM.

**obesa** Malloch, 1929 : 321. Holotype ♂, TASMANIA (AM, Sydney) [examined].

Genus **ZYGOBOTHRIA** Mik

*Zygobothria* Mik, 1891 : 193. Type-species: *Sturmia atropivora* Robineau-Desvoidy, 1830, by original designation. (EUROPE).

**ciliata** Wulp, 1881 : 38 (*Meigenia*). Lectotype ♂ (by designation of Crosskey, 1967d : 104), SUMATRA: Alahan pandjang (RMNH, Leiden) [examined]. – W.A.; NEW GUINEA; widespread ORIENTAL and ETHIOPIAN REGIONS.

**atropivora** Robineau-Desvoidy, 1830 : 171 (*Sturmia*). Syntypes [♂ ♀], [FRANCE] (lost). – N.S.W., QLD; widespread in OLD WORLD.

Robineau-Desvoidy based this species on over eighty specimens that Serville reared from a chrysalis of *Sphinx atropos*. Both sexes are presumed to have been present in this number. None of the syntypes have been located or recognized since and all are presumed lost. (None exist in the remnants of Robineau-Desvoidy's collection in MNHN, Paris.)

Undetermined sp. – A.C.T.

Unplaced species of *Sturmiini*

**castanea** Hardy, 1938 : 63 (*Calopygidia*). Holotype ♂, TASMANIA: Mt Wellington (not located). – TASM.

**dissimilis** Malloch, 1936b : 343 (*Quadra*). Holotype ♂, NEW SOUTH WALES: Como (ANIC, Canberra) [examined]. – A.C.T., N.S.W.

This species is considered not to be congeneric with *ornata* Malloch, type-species of *Quadra*, but no generic assignment is possible at present.

Undescribed spp. (? genera) – various states.

Tribe **GONIINI** Robineau-Desvoidy

GONIDAE Robineau-Desvoidy, 1830 : 74. Type-genus: *Gonia* Meigen, 1803.

Genus **GONIOPHTHALMUS** Villeneuve

*Goniophthalmus* Villeneuve, 1910 : 145. Type-species: *Goniophthalmus simonyi* Villeneuve, 1910, by monotypy. (SOKOTRA).

**australis** Baranov, 1938b : 405 (*Dolichocolon australe*). Lectotype ♂ (by designation of Sabrosky & Crosskey, 1969 : 40), QUEENSLAND: Gympie (BMNH, London) [examined]. – N.S.W., QLD, W.A. (?).

**rufescens** Baranov, 1938b : 406 (*Dolichocolon*). Lectotype ♂ (by designation of Sabrosky & Crosskey, 1969 : 40), NEW SOUTH WALES: Yantabulla (BMNH, London) [examined]. – QLD.

### Genus **PSEUDOGONIA** Brauer & Bergenstamm

*Pseudogonia* Brauer & Bergenstamm, 1889 : 100 (32). Type-species: *Gonia cinerascens* Rondani, 1859 [= *Tachina rufifrons* Wiedemann, 1830], by monotypy. (EUROPE).

*Gaediogonia* Townsend, 1927a : 71. Type-species: *Gaediogonia jacobsoni* Townsend, 1927 [= *Tachina rufifrons* Wiedemann, 1830], by original designation. (SUMATRA).

**rufifrons** Wiedemann, 1830 : 318 (*Tachina*). Holotype ♀, CHINA (UZM, Copenhagen) [examined]. – A.C.T.; NEW GUINEA; SOLOMONS; widespread ORIENTAL & southern PALAEARCTIC REGIONS; AFRICA.

*cinerascens* Rondani, 1859 : 34 (*Gonia*). Syntypes 3 ♂, 4 ♀ [unlabelled], ITALY (MZ, Florence).

*jacobsoni* Townsend, 1927a : 71 (*Gaediogonia*). Holotype ♂, SUMATRA: Fort de Kock (ZM, Amsterdam) [examined].

(For other synonyms see Crosskey, 1966a : 678)

### Tribe **ERYCIINI** Robineau-Desvoidy

ERYCINAE Robineau-Desvoidy, 1830 : 142. Type-genus: *Erycia* Robineau-Desvoidy, 1830.

### Genus **APLOMYA** Robineau-Desvoidy

*Aplomya* Robineau-Desvoidy, 1830 : 184. Type-species: *Aplomya zonata* Robineau-Desvoidy, 1830 [= *Tachina confinis* Fallén, 1820], by subsequent designation of Robineau-Desvoidy (1863 : 459). (EUROPE).

*Leiosia* Wulp, 1893 : 185. Type-species: *Leiosia flavisquama* Wulp, 1893, by monotypy. (JAVA). **Syn. n.**

**flavisquama** Wulp, 1893 : 186 (*Leiosia*). Lectotype ♂ (by designation of Crosskey, 1969 : 104), JAVA (ZM, Amsterdam) [examined]. **Comb. n.** – QLD; JAVA, MALAYA, INDIA.

Undetermined sp. – S.A.

### Genus **APROTHECA** Macquart

*Aprotheca* Macquart, 1851 : 148 (175). Type-species: *Aprotheca rufipes* Macquart, 1851, by monotypy.

*Parabrachelia* Townsend, 1916c : 159. Type-species: *Masicera rufipes* Macquart, 1847 [= *Myobia tenuisetosa* Macquart, 1847], by original designation. **Syn. n.**

**rufipes** Macquart, 1851 : 149 (176). Lectotype ♂ (by fixation of Townsend, 1932 : 49), TASMANIA (MNHN, Paris) [examined]. – TASM. (Probably = *tenuisetosa*)

With the new assignment of *Masicera rufipes* Macquart, 1847, to *Aprotheca* the name *rufipes* Macquart, 1851, becomes a junior secondary homonym. No replacement name is proposed as future study will probably show that the types are conspecific, thus obviating the need for a new name.

**tenuisetosa** Macquart, 1847 : 90 (74) (*Myobia*). Holotype ♂, TASMANIA (BMNH, London) [examined]. **Comb. n.** – TASM.

**rufipes** Macquart, 1847 : 86 (70) (*Masicera*). Holotype ♂, TASMANIA (BMNH, London) [examined].

Genus **AUSTRONILEA** Crosskey

*Austronilea* Crosskey, 1967b : 32. Type-species: *Austronilea livida* Crosskey, 1967, by original designation.

**livida** Crosskey, 1967b : 33. Holotype ♂, AUSTRALIAN CAPITAL TERRITORY: Black Mt (ANIC, Canberra) [examined]. – A.C.T.

Genus **AUSTROPHRYNO** Townsend

*Austrophryno* Townsend, 1916c : 160. Type-species: *Tachina densa* Walker, 1852 [= *Exorista diversicolor* Macquart, 1847], by original designation.

*Archimera* Mesnil, 1954b : 371 (as subg. of *Platymya* Robineau-Desvoidy). Type-species: *Platymya (Archimera) oncoperae* Mesnil, 1954 [= *Exorista diversicolor* Macquart, 1847], by monotypy.

**diversicolor** Macquart, 1847 : 83 (67) (*Exorista*). Holotype ♂, TASMANIA (BMNH, London) [examined]. – A.C.T., N.S.W., TASM.

**densa** Walker, 1852 : 288 (*Tachina*). Holotype ♀, NEW SOUTH WALES (BMNH, London) [examined].

**hebes** Walker, 1852 : 289 (*Tachina*). Holotype ♂ [not ♀], TASMANIA (BMNH, London) [examined].

**erythropus** Walker, 1861c : 298 (*Nemoraeta*). Holotype ♂, TASMANIA (BMNH, London) [examined].

**oncoperae** Mesnil, 1954b : 371 (*Platymya (Archimera)*). Holotype ♂, TASMANIA (CNC, Ottawa, ex coll. Mesnil) [examined].

Genus **BACTROMYIELLA** Mesnil

*Bactromyiella* Mesnil, 1952 : 239–240. Type-species: *Bactromyiella aureocincta* Mesnil, 1952 [= *Masicera ? ficta* Walker, 1861], by original designation. (FIJI).

**ficta** Walker, 1861b : 286 (*Masicera* ?). Holotype ♀ [head lost], INDONESIA: Moluccas, Batjan (publ. as 'Batchian') (BMNH, London) [examined]. – QLD; NEW GUINEA, FIJI, INDONESIA, INDIA.

**semirufa** Malloch, 1930b : 351 (*Sturmia*). Holotype ♂, QUEENSLAND: Kuranda (ANIC, Canberra) [examined].

**aureocincta** Mesnil, 1952 : 240 (*Bactromyiella*). Holotype ♂, FIJI: Nadala (BMNH, London) [examined].

Genus **CHLOROGASTROPSIS** Townsend

*Chlorogastropsis* Townsend, 1926c : 544. Type-species: *Chlorogaster rufipes* Schiner, 1868 [= *Tachina orga* Walker, 1849], by original designation. ('NEW ZEALAND' in error).

*Eipogonoides* Curran, 1938 : 195. Type-species: *Eipogonoides ruficornis* Curran, 1938 [= *Tachina orga* Walker, 1849], by original designation. **Syn. n.**

**orga** Walker, 1849 : 752 (*Tachina*). Lectotype ♂ (by designation of Crosskey, 1966b : 108), NEW SOUTH WALES: Sydney (BMNH, London) [examined]. **Comb. n.** – N.S.W., QLD.

**rufipes** Schiner, 1868 : 323 (*Chlorogaster*). Lectotype ♂ (by present designation), [AUSTRALIA: publ. as 'New Zealand' in error] (NM, Vienna) [examined]. **Syn. n.**

Published as from New Zealand, but correct provenance given as 'Neuholland' (= Australia) by Brauer & Bergenstamm (1889 : 97).

**ruficornis** Curran, 1938 : 196 (*Eipogonoides*). Holotype ♂, NEW SOUTH WALES (BMNH, London) [examined].

Genus *ERYTHROCERA* Robineau-Desvoidy

*Erythrocer*a Robineau-Desvoidy, 1848 : 436. Type-species: *Phryno nigripes* Robineau-Desvoidy 1830, by subsequent designation of Robineau-Desvoidy (1863 : 600). (EUROPE).

*facialis* Mesnil, 1952 : 253. Holotype ♂, QUEENSLAND: Herberton (DEI, Eberswalde) [examined]. – A.C.T., QLD.

Genus *METAPHRYNO* Crosskey

*Metaphryno* Crosskey, 1967*b* : 28. Type-species: *Metaphryno bella* Crosskey, 1967, by original designation.

*bella* Crosskey, 1967*b* : 29. Holotype ♂, NEW SOUTH WALES: 3 mls NW of Rules Point (ANIC, Canberra) [examined]. – N.S.W., VICT.

Genus *PHOROCEROSTOMA* Malloch

*Phorocerosoma* Malloch, 1929*b* : 327. Type-species: *Phorocerosoma setiventris* Malloch, 1929, by original designation. [Junior homonym of *Phorocerosoma* Townsend, 1927.]

*Phorocerostoma* Malloch, 1930*b* : 326. [Replacement name for *Phorocerosoma* Malloch.]

*setiventre* Malloch, 1929*b* : 327 (*Phorocerosoma setiventris*). Holotype ♂, QUEENSLAND: Macpherson Range, National Park (AM, Sydney) [examined]. – N.S.W., QLD.

Genus *PSEUDALSOMYIA* Mesnil

*Pseudalsomyia* Mesnil, 1968 : 178. Type-species: *Pseudalsomyia piligena* Mesnil, 1968, by original designation. (PAKISTAN).

*pilifacies* Mesnil, 1968 : 180. Holotype ♂, NEW SOUTH WALES: Lisarow (BMNH, London) [examined]. – N.S.W.

Genus *TERETROPHORA* Macquart

*Teretrophora* Macquart, 1851 : 174 (201). Type-species: *Teretrophora fasciata* Macquart, 1851, by monotypy.

*fasciata* Macquart, 1851 : 175 (202). Holotype ♀, 'TASMANIA' (MNHN, Paris) [examined]. – N.S.W., TASM. (?).

Undescribed sp. – N.S.W.

## Unplaced species of Eryciini

*crassiseta* Baranov, 1938*b* : 409 (*Bactromyia*). Holotype ♀, QUEENSLAND: Biloela (BMNH, London) [examined]. – QLD.

*quadrissetosa* Curran, 1938 : 204 (*Zenillia*). Holotype ♀, QUEENSLAND: Palm Is. (SPHTM, Sydney) [examined]. – QLD.

*varipes* Macquart, 1846 : 291 (163) (*Masicera*). Holotype ♂ [labelled 'Exorista varipes'], TASMANIA (MNHN, Paris) [examined]. – TASM.

This species, referred to as *Phryno varipes* by Robineau-Desvoidy (1863 : 543), is apparently near *Austrophryno diversicolor* (Macquart) but differs by having the parafacials entirely bare and is left generically unassigned until it can be studied more fully.

Undescribed genera & spp. – N.S.W., S.A., TASM.

## Unplaced species of Tachinidae

**armiceps** Malloch, 1930b : 336 (*Voriella*). Holotype ♀, WESTERN AUSTRALIA: Eradu (ANIC, Canberra) [examined]. – W.A.

**calliphon** Walker, 1849 : 777 (*Tachina*). Holotype ♂ [with puparium], 'PICKTON' (BMNH, London) [examined].

Austen (1907 : 339) noted that the type bears a label 'Picton' and that it is presumably therefore from 'either New South Wales or Canada'. The type also bears (as Austen did not note) a BMNH accession label reading '47 109' (i.e. the 109th collection of insects registered as received by BMNH in the year 1847). Examination of the register shows that this collection consisted of many miscellaneous insects from 'W. Australia', and suggests that *calliphon* must have an Australian provenance; pending other evidence (from later-collected material of the same species which will help to pinpoint the locality) the provenance of the holotype is accepted as Picton, Western Australia (though Picton, New South Wales is an alternative possibility). Up to now the holotype has remained unique; no specimens have been found that associate with it.

**despicienda** Walker, 1861c : 306 (*Tachina*). Holotype ♀ [bad condition], NEW SOUTH WALES [?] (BMNH, London) [examined].

This species was published as from New South Wales and the holotype bears an old ink label 'NSW'. No Australian specimens have been seen that associate with the holotype, which may not have had an Australian provenance. From the surviving characters of the holotype it appears to belong near the genus *Mauritiodoria* Townsend from Mauritius and might be the female of *Mauritiodoria spinicosta* (Thomson).

**diversa** Walker, 1852 : 262 (*Ocyptera* ?). Holotype ♀, 'TASMANIA' (lost).

This name remains a *nomen dubium*. The holotype is lost, and evidence that it originated from Tasmania is inconclusive (there are doubts about several of the provenances cited by Walker in the 1852 work).

**hyalipennis** Macquart, 1855 : 122 (102) (*Phorocera*). Type(s) ♂, SOUTH AUSTRALIA: Adelaide (lost). – S.A. (*Nomen dubium*).

As the type-material is lost this name remains completely enigmatic; it is a junior primary homonym of *Phorocera hyalipennis* Macquart, 1851, from Java.

**inconspicua** Malloch, 1930b : 336 (*Voriella*). Holotype ♀, NEW SOUTH WALES: Sydney (SPHTM, Sydney) [examined]. – N.S.W.

**lateralis** Macquart, 1851 : 176 (203) (*Degeeria*). Holotype ♂, TASMANIA [publ. as 'Oceania'] (MNHN, Paris) [examined]. – TASM. (*Nomen dubium*).

The holotype of this species is in appalling condition, being wholly coated with a brittle deposit and completely concealed in mould. The name therefore remains enigmatic; it is a junior primary homonym of *Degeeria lateralis* Macquart, 1848, from North America.

**melas** Bigot, 1889 : 256 (*Exorista*). Holotype ♀, TASMANIA (lost). (*Nomen dubium*).

The holotype of this species was not in Bigot's collection when that collection came to the BMNH and has not been seen since the time of description. Bigot added the word 'Detrita' after his Latin description, and the holotype was presumably therefore in very bad condition when described. The name remains enigmatic.

**mucrocornis** Macquart, 1851 : 174 (201) (*Phorocera*). Holotype ♀, 'TASMANIA' (MNHN, Paris) [examined]. – TASM. (?). (? Blondeliini or Exoristini).

The holotype of this nominal species is in such bad condition that few features can be made out. It appears, however, to be fairly certainly either a blondeline or an exoristine).

#### SUMMARY OF NOMENCLATURAL CHANGES ESTABLISHED IN THE CATALOGUE

The nomenclatural changes established in the foregoing catalogue are summarized below in their appropriate categories. The order is alphabetical and in the tables of synonyms the invalid junior names are cited first.

## (a) New synonymy in genus-group names

*Austroderia* Malloch, **syn. n.** of *Senostoma* Macquart.  
*Chlorogastrina* Crosskey, **syn. n.** of *Tasmaniomys* Townsend.  
*Dicephalomyia* Malloch, **syn. n.** of *Senometopia* Macquart.  
*Eipogonoides* Curran, **syn. n.** of *Chlorogastropsis* Townsend.  
*Eocarcelia* Townsend, **syn. n.** of *Senometopia* Macquart.  
*Eocarceliopsis* Townsend, **syn. n.** of *Senometopia* Macquart.  
*Lasiocalypter* Malloch, **syn. n.** of *Senostoma* Macquart.  
*Lasiocalyptina* Malloch, **syn. n.** of *Senostoma* Macquart.  
*Leiosia* Wulp, **syn. n.** of *Aplomya* Robineau-Desvoidy.  
*Parabrachelia* Townsend, **syn. n.** of *Aprotheca* Macquart.  
*Rhynchiodexia* Bigot, **syn. n.** of *Senostoma* Macquart.  
*Ruya* Paramonov, **syn. n.** of *Rutilotrix* Townsend.  
*Schizactiana* Curran, **syn. n.** of *Ceromya* Robineau-Desvoidy.  
*Schizoceromyia* Townsend, **syn. n.** of *Ceromya* Robineau-Desvoidy.

## (b) New synonymy in species-group names

*Besserioides sexualis* Curran, **syn. n.** of *Besserioides varicolor* (Curran).  
*Chlorogaster rufipes* Schiner, **syn. n.** of *Chlorogastropsis orga* (Walker).  
*Exorista lata* Macquart, **syn. n.** of *Winthemia lateralis* (Macquart).  
*Exorista marginata* Macquart, **syn. n.** of *Winthemia lateralis* (Macquart).  
*Exorista rufomaculata* Macquart, **syn. n.** of *Phorocerosoma cilipes* (Macquart).  
*Heterometopia rufipalpis* Macquart, **syn. n.** of *Heterometopia argentea* Macquart.  
*Linnaemyia nigripalpus* Tryon, **syn. n.** of *Linnaemya concavicornis* (Macquart).  
*Machrochloria calliphorosoma* Malloch, **syn. n.** of *Machrochloria nitidiventris* (Macquart).  
*Macrochloria calliphorosoma* v. *rufipes* Malloch, **syn. n.** of *Macrochloria nitidiventris* (Macquart).  
*Masicera consanguinea* Macquart, **syn. n.** of *Exorista flaviceps* Macquart.  
*Microtropeza fallax* Hardy, **syn. n.** of *Microtropesa violacescens* Enderlein.  
*Nemoraea brevisetosa* Macquart, **syn. n.** of *Winthemia lateralis* (Macquart).  
*Ocyptera flavifrons* Macquart, **syn. n.** of *Cylindromyia bimacula* (Walker).  
*Omalogaster limbinevris* [sic] Macquart, **syn. n.** of *Heterometopia argentea* Macquart.  
*Omalogaster nitidus* Macquart, **syn. n.** of *Heterometopia argentea* Macquart.  
*Phorocera acutangulata* Macquart, **syn. n.** of *Paropsivora graciliseta* (Macquart).  
*Phorocera maculata* Macquart, **syn. n.** of *Blepharella lateralis* Macquart.  
*Phorocera subpubescens* Macquart, **syn. n.** of *Polychaeta nigra* Macquart.  
*Prosenia albifrons* Malloch, **syn. n.** of *Prosenia conica* Guérin-Méneville.  
*Prosenia indecisa* Malloch, **syn. n.** of *Prosenia macropus* Thomson.  
*Prosenia parva* Malloch, **syn. n.** of *Prosenia dorsalis* Macquart.  
*Senostoma punctum* Walker, **syn. n.** of *Senostoma appendiculatum* (Macquart).  
*Tachina australis* Walker, **syn. n.** of *Blepharipa fulviventris* (Macquart).  
*Winthemia albiceps* Malloch, **syn. n.** of *Winthemia lateralis* (Macquart).  
*Winthemia diversa* Malloch, **syn. n.** of *Winthemia neowinthemioides* (Townsend).  
*Zosteromyia longicornis* Hardy, **syn. n.** of *Zosteromeigenia mima* Townsend.

## (c) New combinations\*

[Note: The new combinations shown are only those that are considered taxonomically valid.  
 The list excludes combinations implied by new synonymy.]

*Alophora* (*Alophorella*) *chrysis* (Malloch) **comb. n.**

*Alophora* (*Alophorella*) *costalis* (Malloch) **comb. n.**

\* See also Appendix, p. 209.

- Alophora (Alophorella) discalis* (Malloch) **comb. n.**  
*Alophora (Hyalomya) normalis* (Curran) **comb. n.**  
*Alophora (Mormonomyia) basalis* (Malloch) **comb. n.**  
*Alophora (Mormonomyia) hyalis* (Malloch) **comb. n.**  
*Alophora (Mormonomyia) lativentris* (Malloch) **comb. n.**  
*Alophora (Mormonomyia) lepidofera* (Malloch) **comb. n.**  
*Alophora (Mormonomyia) nigrihirta* (Malloch) **comb. n.**  
*Alophora (Mormonomyia) sensua* (Curran) **comb. n.**  
*Alophora* (subg. indet.) *hippobosca* (Paramonov) **comb. n.**  
*Alophora* (subg. indet.) *nigrisquama* (Malloch) **comb. n.**  
*Anagonia anguliventris* (Malloch) **comb. n.**  
*Anagonia grisea* (Malloch) **comb. n.**  
*Anagonia lasiophthalma* (Malloch) **comb. n.**  
*Anagonia lateralis* (Macquart) **comb. n.**  
*Anagonia major* (Malloch) **comb. n.**  
*Anagonia opaca* (Malloch) **comb. n.**  
*Anagonia scutellata* (Malloch) **comb. n.**  
*Apatemyia flavipes* (Macquart) **comb. n.**  
*Apatemyia rufiventris* (Macquart) **comb. n.**  
*Aplomya flavisquama* (Wulp) **comb. n.**  
*Aprotheca tenuisetosa* (Macquart) **comb. n.**  
*Argyrothelaira melancholica* (Mesnil) **comb. n.**  
*Blepharipa auripilis* (Robineau-Desvoidy) **comb. n.**  
*Blepharipa coesiofasciata* (Macquart) **comb. n.**  
*Blepharipa fulviventrtris* (Macquart) **comb. n.**  
*Ceracia armata* (Malloch) **comb. n.**  
*Ceracia fergusoni* (Malloch) **comb. n.**  
*Ceromya fergusoni* (Bezzi) **comb. n.**  
*Ceromya valida* (Curran) **comb. n.**  
*Chaetophthalmus ruficeps* (Macquart) **comb. n.**  
*Chlorogastropsis orga* (Walker) **comb. n.**  
*Cuphocera pilifacies* (Macquart) **comb. n.**  
*Eozenillia remota* (Walker) **comb. n.**  
*Ethilla translucens* (Macquart) **comb. n.**  
*Gerocyptera tristis* (Bigot) **comb. n.**  
*Hillomyia polita* (Malloch) **comb. n.**  
*Linnaemya concavicornis* (Macquart) **comb. n.**  
*Macrochloia nitidiventris* (Macquart) **comb. n.**  
*Medinodexia morgani* (Hardy) **comb. n.**  
*Paropsivora australis* (Macquart) **comb. n.**  
*Paropsivora graciliseta* (Macquart) **comb. n.**  
*Paropsivora tessellata* (Macquart) **comb. n.**  
*Peribaea argentifrons* (Malloch) **comb. n.**  
*Peribaea baldwini* (Malloch) **comb. n.**  
*Peribaea orbata* (Wiedemann) **comb. n.**  
*Peribaea plebeia* (Malloch) **comb. n.**  
*Phorocerosoma cilipes* (Macquart) **comb. n.**  
*Pilimyia lateralis* (Macquart) **comb. n.**  
*Rutilotrixa diversa* (Paramonov) **comb. n.**  
*Rutilotrixa monstrosa* (Paramonov) **comb. n.**  
*Rutilotrixa westralica* (Paramonov) **comb. n.**  
*Senostoma apicale* (Curran) **comb. n.**  
*Senostoma appendiculatum* (Macquart) **comb. n.**  
*Senostoma atripes* (Malloch) **comb. n.**

- Senostoma basale* (Curran) **comb. n.**  
*Senostoma brevipalpe* (Macquart) **comb. n.**  
*Senostoma brevipalpe* (Rondani) **comb. n.** (preocc. *brevipalpe* Macquart, see p. 117).  
*Senostoma commune* (Malloch) **comb. n.**  
*Senostoma flavohirtum* (Malloch) **comb. n.**  
*Senostoma hirticauda* (Malloch) **comb. n.**  
*Senostoma hyria* (Walker) **comb. n.**  
*Senostoma mixtum* (Malloch) **comb. n.**  
*Senostoma modestum* (Malloch) **comb. n.**  
*Senostoma nigrihirtum* (Malloch) **comb. n.**  
*Senostoma notatum* (Walker) **comb. n.**  
*Senostoma pallidihirtum* (Malloch) **comb. n.**  
*Senostoma punctipenne* (Macquart) **comb. n.**  
*Senostoma rubricarinatum* (Macquart) **comb. n.**  
*Senostoma setigerum* (Malloch) **comb. n.**  
*Senostoma setiventris* (Malloch) **comb. n.**  
*Senostoma taylori* (Curran) **comb. n.**  
*Senostoma tessellatum* (Macquart) **comb. n.**  
*Senostoma testaceicorne* (Macquart) **comb. n.**  
*Senostoma unipunctum* (Malloch) **comb. n.**  
*Sipholeskia certima* (Curran) **comb. n.**  
*Tasmaniomyia tasmanensis* (Macquart) **comb. n.**  
*Trigonospila braueri* (Townsend) **comb. n.**  
*Trigonospila brevifacies* (Hardy) **comb. n.**  
*Trigonospila fasciata* (Hardy) **comb. n.**  
*Tritaxys scutellata* (Macquart) **comb. n.**

(d) New names for junior homonyms

- Hillomyia* Crosskey **nom. n.**, for *Hillia* Malloch (preoccupied by *Hillia* Grote).  
*macquarti* Crosskey **nom. n.**, for *Masicera auriceps* Macquart, 1851 (preoccupied by *Masicera auriceps* Macquart, 1843).

LECTOTYPE DESIGNATIONS

New lectotype designations are made below for twelve nominal species occurring in Australia (ten described from Australia and two with an extra-Australian original provenance). Each lectotype and available paralectotype has been appropriately labelled.

*Ceromasia sphenophori* Villeneuve, 1911 : 81-82.

Described from one ♀ and three ♂ syntypes sent to Villeneuve by de Meijere for study. LECTOTYPE ♂, NEW GUINEA: Papua [Laloki River area near Port Moresby], vii-viii. 1909 (*F. Muir*) (in Zoölogisch Museum, Amsterdam). Paralectotype ♂, NEW GUINEA [probably same provenance as lectotype] (CNC, Ottawa, ex Villeneuve-Mesnil coll.).

The lectotype bears labels in Villeneuve's writing that read 'Type' and 'Ceromasia sphenophori ♂ Villen', and the paralectotype bears a Villeneuve label reading 'Ceromasia sphenophori type ♂ Villen'.

The ZM, Amsterdam, collection contains two ♀ specimens of *C. sphenophori* from Ambon (=Amboyna, Moluccas) each with a pencilled label, one reading 'Ambon' and the other 'Ambon vi vii 08'. It is known that Muir collected in Amboyna and obtained *sphenophori* there in the year prior to that in which he obtained the species at his Laloki river camp in Papua, and the year date 08 (=1908) fits with this. It is possible that one of the Amboyna females is an original syntype, even though Villeneuve mentioned only New Guinea in the description. Good evidence is lacking, however, and the Amboyna specimens are considered not to have any type-status (neither bears a label by Villeneuve).

***Chlorogaster rufipes* Schiner, 1868 : 323.**

Described from one ♀ and two ♂ syntypes. LECTOTYPE ♂, AUSTRALIA (in Naturhistorisches Museum, Vienna). Paralectotype ♀, data as lectotype (also in NM, Vienna). The third (♂) syntype has not been seen. The lectotype bears a label in purple ink reading 'rufipes Type Br. Bgst.', another label reading 'N. Holland Alte Sammlung' and a third label reading 'rufipes det. B.B.' (the specific name in ink, remainder in print); the paralectotype has identical labels.

The provenance was published originally as 'Neuseeland' but this was corrected to 'New Holland' by Brauer & Bergenstamm (1889 : 97).

***Dexia aditha* Walker, 1848 : 854.**

The type-material of this nominal species was cited as 'Holotype' in the recent revision of the Rutiliini (Crosskey, 1973). Whilst that paper was in press, however, it was discovered that a second original specimen had been inadvertently incorporated into the Australian National Insect Collection (having been loaned to the late Dr Paramonov several years ago and not returned to British Museum (Natural History)). It is now certain that the original material consisted of two syntypes, and the specimen earlier referred to as 'holotype' is here newly designated as lectotype.

LECTOTYPE ♂, AUSTRALIA: Western Australia, Swan River (*Richardson*) (in British Museum (Natural History), London). Paralectotype ♂, same data as lectotype (also in BMNH).

Lectotype and paralectotype bear identical labels reading as follows: circular white label with '43 14' on one side and 'Swan River' on the reverse side in slightly faded black ink; pencilled label 'Swan R. W. Australia. Dr. Richardson. 43.14.' in Austen's writing. (The figures '43 14' refer to the 14th collection of insects incorporated into the BMNH collection in 1843.)

***Microtopeza* [sic] *violacescens* Enderlein, 1937 : 441.**

Described from three ♂ and two ♀ syntypes. LECTOTYPE ♂, AUSTRALIA: Queensland, Herberton, 3700 ft, xii. 1910 (Dodd) (in Deutsches Entomologisches

Institut, Eberswalde). Paralectotypes: 2 ♂, 2 ♀, same data as lectotype (♂ & ♀ in DEI, Eberswalde, and ♂ & ♀ in MNHU, Berlin).

Each type-specimen has a printed label 'Herberton Dodd XII.1910 3700 Ft.' and Enderlein's name label. The generic name is mis-spelt 'Microtopeza' on each name label as well as in the original publication.

***Palpostoma aldrichi* Hardy, 1938 : 57 (= *testacea* sensu Aldrich).**

Aldrich (1922) described a species of *Palpostoma* that he considered to be *P. testaceum* Robineau-Desvoidy from a female and five male specimens from Cairns in northern Queensland. Hardy (1938) considered that Aldrich's species could not be the true *P. testaceum*, as Robineau-Desvoidy would not have had the same species. This supposition of Hardy is the merest conjecture, unsupported by any real evidence (as Robineau-Desvoidy's original material of *testaceum* is lost and it is still not known, in the unsatisfactory taxonomic state of *Palpostoma*, whether the same species may occur in north Queensland as are found in New South Wales – the most probable provenance of Robineau-Desvoidy's material); nevertheless, Hardy's name *P. aldrichi* that he published for Aldrich's supposedly misidentified *testaceum* is available in nomenclature. The name is not accompanied by any description, but the reference is given to Aldrich's (1922) description under the name *testacea* [sic] and the name *aldrichi* is therefore available under Article 13 (a) (ii) of the ICZN.

The type-material of *aldrichi* is comprised of the six specimens cited by Aldrich. Aldrich stated that three of these (♂) had been returned to the collector (Illingworth), and the others (two ♂, one ♀) retained for the USNM collection. The specimens returned to Australia have not been located (though possibly still present in a collection in Brisbane) but the others are in Washington, and a lectotype is here designated from them.

LECTOTYPE ♂, AUSTRALIA: Queensland, Cairns, 1919 (*J. F. Illingworth*) (in United States National Museum, Washington D.C.). Paralectotype ♂, same data as lectotype (label lacking collector's name) (USNM); paralectotype ♀, Queensland, Babinda, 1919 (*J. F. Illingworth*) (USNM).

The lectotype is labelled 'Cairns N. Q. 19' and 'J. F. Illingworth Coll. Ex. Window' and bears Aldrich's identification label as '*testacea*'. There are discrepancies between the labelling of the paralectotypes and Aldrich's published data, but it seems probable that Aldrich was citing data only from the specimen that he retained and labelled (i.e. the lectotype) and that the two specimens here treated as paralectotypes that he also retained (a ♂ and a ♀) are part of the type-series in spite of the discrepancies; the female is labelled as from Babinda (not Cairns) and the male is labelled as collected by A. P. Dodd (not J. F. Illingworth).

***Senostoma ? punctum* Walker, 1858 : 205.**

Described from 'Australia and New South Wales', from which statement it is clear that there were at least two original syntypes. Two specimens are in

BMNH collection, one from New South Wales and the other without locality label; these are considered to be both original syntypes as both came from Saunders' collection (they are males, whereas Walker stated 'Female', but errors of sexing are frequent in Walker's work). LECTOTYPE ♂, AUSTRALIA: New South Wales (in British Museum (Natural History), London). Paralectotype ♂, AUSTRALIA presumed (also in BMNH, London).

***Sisyropa cinerea*** Brauer & Bergenstamm, 1891 : 346 (42).

Described from both sexes but without statement of the number of specimens. Existing material consists of one ♂ and one ♀ syntype (mis-associated with each other). LECTOTYPE ♂, AUSTRALIA: Queensland, Rockhampton, 1868 (*Thorey*) (in Naturhistorisches Museum, Vienna). (Only the Rockhampton locality is mentioned in the original description.)

The lectotype bears a label reading 'Thorey 1868 Rock-hampton' (the word Thorey and figures 186 in print, remainder in black ink), a label 'cinerea det. B. B' (handwritten in black ink except for the letters 'det.') and a label in purple ink reading 'Blepharipoda Sisyropa'. The paralectotype is similarly labelled except that the words 'Cap York' are given for locality on the first label and there is no label in purple ink.

Lectotype and paralectotype are mis-associated, the former being a *Carcelia* and the latter a winthemiine (*Nemorilla* sp.). Mesnil (1950b : 9) referred to 'le *Carcelia* (*Eucarcelia*) *cinerea* B. B. dont nous avons vu le type', but this statement does not restrict the name to a single recognizable specimen and therefore does not constitute a valid lectotype fixation. Present designation of the ♂ specimen as lectotype maintains the sense of the name used by Mesnil. Here it should be noted that Crosskey (1966b : 109) cited his assignment of *cinerea* to *Carcelia* as a new combination; this was due to an oversight, Mesnil's (1950b) earlier assignment to *Carcelia* in a work on African Carceliini having been overlooked.

***Tachina bura*** Walker, 1849 : 760.

Described from two specimens, one presented to BMNH by Rev. T. Ewing from Van Diemen's Land, and the other from New Holland and in the Rev. J. Wenham's collection. Only the specimen from Tasmania has been found, which is here designated as lectotype. LECTOTYPE ♂, AUSTRALIA: Tasmania (in British Museum (Natural History), London).

The lectotype bears a circular white accession label with the ink figures '46 81' and a pencilled label in Austen's writing that reads 'Tasmania. Rev. J. Ewing. 46. 81'.

***Tachina ruralis*** Fallén, 1810 : 265.

Described from an unstated number of specimens of both sexes from 'Esperöd i Skåne'. The Fallén collection at Stockholm contains seven specimens standing

under the name *ruralis*, none of them with data labels; one is ♂ and six are ♀. In the absence of contrary evidence all seven specimens are accepted as syntypes. The ♂ syntype is the only specimen that belongs to the well-known and nearly cosmopolitan species that has long been known as *Voria ruralis* (Fallén) and this specimen is therefore designated as lectotype. LECTOTYPE ♂, SWEDEN: Skäne, Esperöd (in Naturhistoriska Riksmuseum, Stockholm). Paralectotypes 7 ♀, data presumed as lectotype (also in NR, Stockholm).

The lectotype bears a very old label reading (in faded ink) 'Tachina ruralis ♂ Fallén', and one of the ♀ paralectotypes bears an identical label. Other paralectotypes are unlabelled.

All six ♀ paralectotypes are mis-associated with the ♂ lectotype. They belong to a species of *Exorista*, most of them probably being *Exorista rustica* (Fallén, 1810). This species was described immediately before *ruralis* in Fallén (1810 : 264), and Fallén noted in the description of *ruralis* its similarity to *rustica*. There may at some time have been a confusion of the specimens of *rustica* and *ruralis*, but the present designation of the ♂ syntype as lectotype maintains the longstanding usage of the name *ruralis* for a species of *Voria* Robineau-Desvoidy and not of *Exorista* Meigen.

***Zosteromyia brevifacies* Hardy, 1934 : 36.**

Described from one ♀ syntype from Tooloom (N.S.W.) and a ♀ and two ♂ syntypes from Mt. Wellington (Tasmania). The Tooloom specimen is designated as lectotype; the other syntypes have not been located. LECTOTYPE ♀, AUSTRALIA: New South Wales, Tooloom, 29.i.1926 (in Queensland Museum, Brisbane: registered No. T.7127).

The lectotype bears an ink label reading 'Tooloom NSW 29.1.26' and a name label in Hardy's writing reading 'Zosteromyia brevifacies Hardy PARATYPE'. (As no holotype was designed in the original publication the specimen is an original syntype, not a paratype.)

***Zosteromyia longicornis* Hardy, 1934 : 36.**

Described from three ♂ syntypes from Brisbane and Mt Glorious. LECTOTYPE ♂, AUSTRALIA: Queensland, Mt Glorious, 25.iv.1930 (in University of Queensland, Brisbane). Paralectotype ♂, same data as lectotype (in BMNH, London). The third syntype has not been located.

The lectotype bears an ink label reading 'Mt Glorious 25.4.30' and a name label in Hardy's writing reading 'Zosteromyia longicornis Hardy PARATYPE'. (As no holotype was designated in the original publication the specimen is an original syntype, not a paratype.)

***Zosteromyia morgani* Hardy, 1934 : 37.**

Described from four ♂ specimens (syntypes) without a designated holotype. LECTOTYPE ♂, AUSTRALIA: New South Wales, Biniguy [publ. as 'Binniguy'],

22.ii.1930 (*W. L. Morgan*) (in New South Wales Department of Agriculture, Rydalmere). Paralectotype: 1 ♂, same data as lectotype (in NSWDA, Rydalmere); 1 ♂, New South Wales, Narara [publ. as 'Worara'], 11.xi.1931 [publ. as '30'] (*W. L. Morgan*) (NSWDA, Rydalmere).

The lectotype bears an ink label reading 'Bred from *Aulacophora hilaris* adult coll. Binniguy 22.2.30. W. L. Morgan' and the condition is fair except for some collapse of the eyes and scutum and loss of apical half of left wing. One paralectotype is labelled exactly as the lectotype and has its associated puparium (the abdomen is gummed separately to the card mount); the other paralectotype is labelled in ink 'Bred from *Aulacophora hilaris* adult coll. Narara 11.11.31 W. L. Morgan'.

The lectotype and paralectotypes each bear a name label in Hardy's writing that reads '*Zosteromyia morgani* Hardy PARATYPE' and a printed label 'Department of Agriculture, Sydney, N.S.W., Australia'.

#### SUMMARY OF AUSTRALIAN NOMINAL SPECIES FOR WHICH TYPES ARE LOST OR MISSING

The foregoing catalogue contains the names of 487 nominal species-group taxa described from Australia (up to 1973). Primary types are known to exist for 458 of these taxa, but are lost or have not been located for the remaining 29 taxa. The lost or missing types fall into two categories that are differentiated in the lists of missing types that follow. The first category is that of types that can confidently be asserted to be lost: in these cases (all of them nominal species described by nineteenth-century authors) the types have never been found by later workers and no specimens that could be the types have been found during personal searches of likely depositories carried out for the preparation of this catalogue. The second category is that of types which have not been found during the preparation of this work but which may still exist: in these cases (mainly nominal species described by twentieth-century authors) it is probable that types still exist and will eventually be found in some small collection or unexpected place (those of the two species described by Rondani, for example, may well be in a small Italian museum but appear certainly not to be in Florence, Naples, or Genoa). The distinction here made between 'lost' and 'missing' types is emphasized to assist future revisionary work: it is considered that later workers may safely assume that the types listed as 'lost' are truly lost or destroyed and will never be found; on the other hand, searches will need to be made for the types listed as 'missing' whenever the relevant groups are studied in detail. The lists are alphabetical under the original binomina.

##### (a) Nominal species of which the types are lost

*Carcelia tasmanica* Robineau-Desvoidy

*Dexia hyria* Walker

*Exorista melas* Bigot

*Micropalpus bicolor* Macquart.  
*Musca sinuata* Donovan  
*Ocyptera* ? *diversa* Walker  
*Omalogaster nitidus* Macquart  
*Palpostoma testacea* Robineau-Desvoidy  
*Phorocera hyalipennis* Macquart (1855)  
*Rutilia australasia* Gray  
*Rutilia fulvipes* Guérin-Méneville  
*Rutilia vidua* Guérin-Méneville  
*Verreauxia auripilis* Robineau-Desvoidy

(b) Nominal species of which types are missing

*Calopygidia castanea* Hardy  
*Cuphocera pilosa* Malloch  
*Dexia brevipalpis* Rondani  
*Euthera skusei* Bezzi  
*Exorista trichopareia* Schiner  
*Linnaemyia nigripalpus* Tryon  
*Microtropesa skusei* Bergroth  
*Microtropeza fallax* Hardy  
*Prosenia albifrons* Malloch  
*Prosenia indecisa* Malloch  
*Prosenia varia* Curran  
*Rhinomyobia australis* Brauer & Bergenstamm  
*Rutilia spinolae* Rondani  
*Schizotachina fergusonii* Bezzi  
*Zosteromyia fasciata* Hardy  
*Zosteromyia minor* Hardy

PART III—A HOST CATALOGUE FOR THE AUSTRALIAN TACHINIDAE

INTRODUCTION

The hosts of very nearly all true Tachinidae (from which I exclude the Rhinophoridae, a group sometimes treated as tachinids) are other insects, but centipede hosts are known. As a rule the larval or pupal stages of the hosts are parasitized, especially the caterpillars of Lepidoptera and Hymenoptera Symphyta and the soil- or wood-inhabiting grubs of Coleoptera, but when hemimetabolous insects are the hosts it is usually the adult stage that is attacked; a few forms parasitize adult beetles. The host-relations of the Australian Tachinidae conform in their essentials with the general picture of tachinid parasitism, and there are no insect orders providing hosts in Australia that do not also provide hosts in other zoogeographical regions. In Australia eight insect orders are so far known

positively to provide hosts, and these same orders provide the hosts for the overwhelming majority of world forms: the Lepidoptera and Coleoptera, as elsewhere, provide the greatest number of different host species, and the Orthoptera, Hemiptera-Heteroptera and Hymenoptera are regularly parasitized by particular groups of Australian tachinids; a few species of stick-insects (Phasmatodea) and mantids (Mantodea) also provide hosts. The rather well developed fauna of Embioptera in Australia is not known to have tachinid parasites, but may be found to do so (as the tachinid genus *Rossimylops* Mesnil is parasitic on an embiopteran in South Africa). There is one remarkable record of an Australian tachinid parasitizing adult Tabanidae (Diptera) (Spratt & Wolf, 1972).

Tachinids are presumed to play an important role in the natural regulation of the numbers of their hosts, but this is difficult to quantify. In Australia many of the economically important insect pests are attacked by tachinid parasites, and some parasite species are regularly reared in numbers from their host pest species. Particular tachinid groups may be confined to particular host groups (e.g. the Phasiinae only attack Hemiptera and the Acemyini only attack Orthoptera) but true host-specificity in the sense of a single species of parasite confined to a single host-species is apparently rare in the Australian fauna (and the apparent instances where host-specificity occurs are probably mainly due to insufficient knowledge). Certainly several of the main injurious pests are attacked by several species of tachinid, and many of the tachinids attacking these pests also have other hosts (as is evident from the accompanying parasite-host and host-parasite lists).

The range of economically important Australian insect pests that are attacked by Tachinidae is very diverse, and includes pests of agricultural crops (sugar-cane, cotton, maize, cucurbits) and many serious defoliators of forest timbers. Some of the most important pests, with their parasite-groups, are: the cotton bollworm (*Heliothis armigera*), the army-worm (*Persectania*, *Pseudaletia*, *Spodoptera* spp.) and cutworm (*Agrotis*) pests of cotton and other crops that are attacked by many species of Tachininae and Goniinae; the sugar-cane borer weevil (*Rhabdoscelus obscurus*) attacked by *Lixophaga sphenophori*; the white-grub larvae of melolonthine beetles, especially the sugar-cane white-grub (*Dermolepida albohirta*) of the Queensland canefields, attacked by species of *Palpostoma* and of Rutiliini; the introduced scarabaeid beetle *Heteronychus arator*, a pest of maize in New South Wales, that is attacked by species of *Palpostoma*; the chrysomelid beetle *Aulacophora hilaris* that destroys the foliage and flowers of cucurbitaceous crops, attacked by a species of Blondeliini; the cotton-stainer bug (*Dysdercus sidae*) of Queensland, attacked by species of Phasiinae; the pergid sawfly defoliators of *Eucalyptus*, attacked by several species of the *Anagonia-Froggattimyia* complex (Blondeliini); the chrysomelid beetle *Paropsis atomaria*, a pest of *Eucalyptus*, attacked by several species of Blondeliini; and the stick-insect *Didymuria violescens*, a serious defoliator of *Eucalyptus* in New South Wales, that is attacked by an undescribed tachinid of very uncertain systematic position.

Despite the diversity of economically important insect pests, and the extent of work undertaken on them by Australian departments of agriculture and

forestry, there has not up to now been any published host-list for the Australian Tachinidae. The only published host records available have been scattered in original tachinid descriptions or cited haphazardly in departmental reports or in accounts of particular pests, and these were the main sources for the relatively few entries in W. R. Thompson's *A Catalogue of the Parasites and Predators of Insect Pests* concerned with Australian Tachinidae. Many of the earlier records existing in these various publications cannot be relied upon, either because of changes in the nomenclature of the hosts and parasites or because of misidentification, especially of the tachinids, and for some time an up-to-date host catalogue for the Australian Tachinidae has been needed that is based so far as possible on reliably named hosts and parasites and on the latest information available.

The host catalogue here presented may not be exhaustive, as there are probably some tachinid specimens scattered in Australian collections that were reared from known hosts but have not been available during the present study. Nevertheless the lists of hosts and parasites are sufficiently comprehensive to form useful basic lists that can be gradually augmented as more evidence on the host-relations is acquired.

A major difficulty in compiling dependable host-parasite lists is the unreliability of the identifications. As a rule, material of the hosts is not kept in collections with the reared Tachinidae so that confirmation of identity of both host and parasite is difficult or impossible. In general, however, it is likely that the hosts will have been correctly identified, since they are commonly well known pests and often are conspicuous Lepidoptera whose specific identities are not in doubt (even if the lepidopterists are in dispute about the generic placements). On the other hand identities of tachinid parasites are likely to be wrong unless they have been recently checked by a specialist on the group (and in some difficult groups of tachinids even this is no guarantee for every specimen). In preparing the accompanying parasite-host and host-parasite lists it has been assumed that the hosts have been correctly identified, but the tachinids have only been recorded when: (1) they have been personally identified, (2) when the host record is from the original type-material of the tachinid parasite, or (3) when published records, other than the original descriptions, are undoubtedly based on correctly identified Tachinidae. The last circumstance is relatively infrequent, and most host records in the literature have been discounted because the identities cited for the tachinid parasites are either wrong or suspect (for example, most of G. H. Hardy's identifications of Australian Tachinidae were based on guesswork from the literature and in consequence were often in error: hence his published host records have usually been discounted).

The information for the host catalogue derives largely from specimens in the collection of the British Museum (Natural History). Many of these specimens have been received from time to time as duplicate specimens submitted to the Commonwealth Institute of Entomology for identification, usually by Australian state departments of agriculture and forestry; for this reason the BMNH collection is more comprehensive than any other in Australian Tachinidae reared from known hosts, and the host catalogue is almost as completely comprehensive as it is possible

to make it at the present time (though, as aforesaid, a search of collections in Australia will yield up a few additional records that have not been known to me while preparing the present work).

#### A SYNOPSIS OF THE HOST-RELATIONS OF AUSTRALIAN TACHINIDAE

Hosts are known for almost a quarter of the described Australian tachinid fauna, but as the described fauna probably does not represent more than about a quarter or fifth of the actual number of species in Australia it is evident that knowledge of the hosts is only very fragmentary at present. The following comments summarize the host-relations for the different host orders and parasite groups, so far as they can be generalized from what is already known.

**Lepidoptera.** This order provides the hosts for the great bulk of forms in the Tachininae and Goniinae, but is not parasitized by any Phasiinae or Proseninae. Both butterflies and moths are attacked, and 27 families are so far known to provide tachinid hosts in Australia. Some lepidopterous species, especially in the Noctuidae, are attacked by several species of Tachinidae, at least nine species attacking the army-worm *Pseudaletia unipuncta*.

**Coleoptera.** This order is next in importance to the Lepidoptera in the number of host members it provides, though up to now only four families are known to be involved as hosts of Australian Tachinidae. Members of the order are attacked by the Proseninae, Palpostomatini, several genera of Blondeliini and apparently by *Apatemyia* (probably Leskiini) and *Pseudalsomyia* (Eryciini). The Proseninae and Palpostomatini are confined to beetle hosts in the larval and adult stages respectively and mainly attack Scarabaeidae.

**Hemiptera.** Heteropterous land bugs are hosts of the Phasiinae only, and in Australia this subfamily (on the limited evidence so far) is confined to hemipterous hosts. Members of the Coreidae, Lygaeidae and Pyrrhocoridae provide the hosts so far discovered, but the Australian Pentatomidae are almost certainly parasitized also (as the genus *Pentatomophaga* has pentatomid hosts in Java and New Guinea).

**Orthoptera.** Acridoidea of the families Acrididae and Eumastacidae are the hosts of the Acemyini, and this tribe is confined to acridoid hosts. The most polyphagous species of tachinid known in the Australian fauna, though its host species are all acridids and eumastacids, is *Ceracia fergusoni*, which has been reared from 28 host species (22 undescribed and the others named). Blackith (1967) has discussed this species under the name *Myothyria fergusoni*, and this work is the only paper of any note that has yet appeared on the biology of any Australian Tachinidae. Hosts are not yet known in Australia for *Phorocerosoma* (tribe Ethillini) or the Ormiini, but it is likely that these tachinids will be found to have orthopterous hosts: *Phorocerosoma* is a parasite of Acridoidea in Japan and in Africa, and the Ormiini are parasites of nocturnally active Tettigoniidae s.l. wherever the hosts are known (New World, southern Europe, Fiji).

**Hymenoptera.** In Australia the Hymenoptera are parasitized only by a few members of the subfamily Goniinae. The Anacamptomyiini are parasites in the nests of certain Vespoidea, and several species of the *Froggattimyia-Zenargomyia* complex (Blondeliini) attack the larvae of certain sawflies (Pergidae and Argidae).

**Phasmatodea.** Although 130 species of Phasmatidae are known in Australia only two of these are known to be hosts of Tachinidae. These two species are attacked by an undescribed species of Tachinidae that represents an undescribed genus of doubtful affinity (but possibly belonging near the Acemyini). This tachinid is remarkable for its very strong downcurved hook-like ovipositor. The hosts of the genus *Mycteromyiella* (? Ethillini) are not known in Australia, but in the Solomon Islands species of *Mycteromyiella* attack stick-insects of the genera *Ophicrania* Kaup and *Megacrania* Kaup; it seems likely that the Australian species of *Mycteromyiella* might similarly attack phasmatids.

**Mantodea.** Only one of the 118 species of Mantodea in Australia has so far been recorded as host of a tachinid, viz. *Pseudomantis albofimbriata* which has been found parasitized by *Exorista coras*. Ordinarily the Lepidoptera are hosts of exoristine tachinids, but the record of *E. coras* from a mantid and of an unidentified *Exorista* species from a mantid in Guadalcanal (latter obtained by R. W. Paine) suggest that parasitism of mantids by exoristine tachinids is an occasional phenomenon in a group that habitually parasitizes lepidopterous caterpillars. In other regions the Mantodea are parasitized by other tachinid tribes that are probably close relatives of the Exoristini, such as the Masiphyini in the Neotropical Region and certain Ethillini in the Ethiopian Region.

**Diptera.** The only record of Diptera as hosts of Tachinidae in Australia is that of Spratt & Wolf (1972).

#### The subfamilies and tribes of Australian Tachinidae and their host groups

The following synopsis is given to show at a glance the various host groups for the subfamilies and tribes of Tachinidae known to be represented in Australia. The subfamilies and tribes are listed in the systematic order adopted in the taxonomic catalogue (Part II). For some tribes there are no Australian host records yet available, in which case the host information given is derived from extra-Australian records and annotated as appropriate.

<i>Subfamily</i>	<i>Tribe</i>	<i>Host-group</i>
PHASIINAE	Trichopodini	Hemiptera-Heteroptera
	Phasiini	Hemiptera-Heteroptera
	Cylindromyiini	Hemiptera-Heteroptera [apparently no Australian records to date]
	Leucostomatini	Hemiptera-Heteroptera
	Eutherini	Hemiptera-Heteroptera Pentatomidae [no Australian records to date]
PROSENINAE (DEXIINAE)	Prosenini	Coleoptera (larvae)
	Rutiliini	Coleoptera (larvae)

TACHININAE (MACQUARTIINAE)	Palpostomatini*	Coleoptera (adults)
	Myiotrixini*	[Unknown]
	Ormiini*	Orthoptera Tettigoniidae s.l. [no Australian records to date]
	Glaurocarini*	Orthoptera Tettigoniidae of <i>Glaurocara</i> , Lepidoptera of <i>Doddiana</i> [no Australian records to date]
	Campylochetini	Lepidoptera (larvae)
	Voriini	Lepidoptera (larvae)
	Thelairini	Lepidoptera (larvae) [no Australian records to date]
	Minthoini	Lepidoptera (larvae)
	Nemoraeni	Lepidoptera (larvae)
	Leskiini	Lepidoptera (larvae)
	Ernestiini	Lepidoptera (larvae)
	Parerigonini*	[Apparently unknown, no Australian records to date]
	Linnaemyini	Lepidoptera (larvae)
	Tachinini	Lepidoptera (larvae)
GONIINAE	Acemyini	Orthoptera Acridoidea
	Neaerini	Lepidoptera (larvae)
	Siphonini	Lepidoptera (larvae)
	Blondeliini	Coleoptera (larvae and adults), Hymenoptera Symphyta (larvae), Lepidoptera (larvae)
	Exoristini	Lepidoptera (larvae), Hymenoptera Symphyta (larvae) [no Australian records to date], Mantodea [very rarely]
	Ethillini	Lepidoptera (larvae), Orthoptera Acridoidea for <i>Phorocerosoma</i> [no Australian records to date], Phasmatodea for <i>Mycteromyiella</i> [no Australian records to date, genus possibly not true ethilline]
	Winthemiini	Lepidoptera (larvae)
	Carceliini	Lepidoptera (larvae)
	Anacamptomyiini	Hymenoptera Vespoidea (larvae)
	Sturmiini	Lepidoptera (larvae), Hymenoptera Symphyta (larvae) [rarely, no Australian records to date]
	Goniini	Lepidoptera (larvae)
	Eryciini	Lepidoptera (larvae), Coleoptera Cerambycidae (larvae) for <i>Pseudalsomyia</i> , Hymenoptera Symphyta (larvae) [rarely, no Australian records to date], Diptera Tabanidae (adults) for <i>Bactromyiella</i>

\* The affinities of the tribes so marked are very obscure. Their placement in Tachininae is an interim measure until the relationships can be more clearly determined. Sabrosky & Arnaud (1966), following Townsend, place the Palpostomatini in Phasiinae and the Glaurocarini and Ormiini in Proseninae.

#### PARASITE-HOST LIST

The tachinid parasites cited in the list are arranged in alphabetical order of their tribes, and alphabetically by genus and species within each tribe; the names used

are those considered valid in the taxonomic catalogue (Part II). The names of hosts are those considered currently valid and are arranged alphabetically within each host family; when two or more families are represented in the host list pertaining to any parasite then each begins on a separate line. The order and family of the host(s) are shown in parentheses after the host name(s), and the following abbreviations are used for the host orders: COL., Coleoptera; HEM., Hemiptera; HYM., Hymenoptera; LEP., Lepidoptera; MANT., Mantodea; ORTH., Orthoptera; PHAS., Phasmatodea. Subgeneric names are omitted for both tachinids and hosts. Authors' names are omitted for both parasite and host species: those of the Tachinidae can be found in the taxonomic catalogue (Part II) and those for the hosts are given in the 'host-parasite list' (beginning on p. 178).

The great majority of host records are derived from data on tachinid specimens in the British Museum (Natural History) collection or from host data published with the original tachinid descriptions, or from both, and these are the sources of information unless a host name is annotated by an entry in square brackets. Annotations in square brackets refer to host records that are accepted as correct, either on the basis of a published record that is unexceptionable or on the basis of tachinid specimens from known hosts examined and identified by me and housed in an Australian departmental collection. In citing such collections the following abbreviations are used: NSWDA, New South Wales Department of Agriculture, Rydalmere; QDPI, Queensland Department of Primary Industries, Brisbane; WARI, Waite Agricultural Research Institute, South Australia. These abbreviations are only used when the collections to which they refer contain species from known hosts that are *not* duplicated by specimens in the BMNH collection; when specimens of any tachinid parasite from the same host are housed both in the BMNH collection and in NSWDA, QDPI or WARI then no annotation is given.

Whenever such information has been available the hosts are listed for undescribed or undeterminable species as well as those for which specific identities are known. Similarly, hosts are indicated for known tachinid parasites in instances where the host identities are not fully known.

#### *Tachinid Parasites*

#### *Hosts*

### ACEMYINI

*Ceracia fergusoni*

*Azelota diversipes*, *Chortoicetes terminifera*, *Macrotona australis*, *Urnisa rugosa* (ORTH., Acrididae) [Blackith, 1967]

*Keyacris interpres*, *Keyacris marcida*, *Moraba amiculi*, *Moraba keyi*, *Moraba misilliformis*, *Moraba viatica*, and 22 undescribed spp. (ORTH., Eumastacidae) [Blackith, 1967]

*Ceracia* spp.

*Coryphistes longipennis*, *Gastrimargus musicus* (ORTH., Acrididae)

## ANACAMPTOMYIINI

- |                                   |   |
|-----------------------------------|---|
| <i>Anacamptomyia nigriventris</i> | <i>Polistes tasmaniensis</i> , <i>Polistes</i> sp. (HYM., Vespidae) |
| <i>Euvespivora decipiens</i>      | <i>Polistes</i> sp. (HYM., Vespidae)                                |
| <i>Koralliomysia</i> sp.          | <i>Ropalidia marginata jucunda</i> (HYM., Vespidae)                 |
| <i>Koralliomysia</i> sp.          | <i>Polistes</i> sp. (HYM., Vespidae)                                |

## BLONDELIINI

- |                                 |   |
|---------------------------------|---|
| <i>Anagonia anguliventris</i>   | <i>Paropsis atomaria</i> (COL., Chrysomelidae)  |
| <i>Anagonia lasiophthalma</i>   | <i>Gonipterus scutellatus</i> (COL., Curculionidae)   |
| <i>Anagonia lateralis</i>       | <i>Bryachus squamicollis</i> (COL., Curculionidae). Unidentified chrysomelid larva (COL.)                 |
| <i>Anagonia scutellata</i>      | Unidentified chrysomelid (COL.)   |
| <i>Compsilura concinnata</i>    | <i>Anomis xanthindyma</i> [QDPI], <i>Brithys crini</i> , <i>Spodoptera</i> sp. [QDPI] (LEP., Noctuidae)   |
|                                 | <i>Doratifera vulnerans</i> [NSWDA] (LEP., Limacodidae)   |
|                                 | <i>Archips australana</i> [NSWDA] (LEP., Tortricidae)   |
|                                 | Numerous other LEP. hosts in extra-Australian regions   |
| <i>Froggattimyia hirta</i>      | <i>Lophyrotoma</i> sp. <i>Perga glabra</i> , <i>Pterygophorus analis</i> [Malloch, 1934] (HYM., Pergidae) |
| <i>Froggattimyia nicholsoni</i> | <i>Perga dorsalis</i> (HYM., Pergidae)  |
| <i>Froggattimyia tillyardi</i>  | <i>Paropsis atomaria</i> (COL., Chrysomelidae)  |
| <i>Froggattimyia wentworthi</i> | Unidentified pergid (HYM.)  |
| <i>Lecanipa</i> sp. (2)         | <i>Pterolocera</i> sp. (LEP., Anthelidae)   |
| <i>Lixophaga sphenophori</i>    | <i>Rhabdoscelus obscurus</i> (COL., Curculionidae)  |
| <i>Medinodexia morgani</i>      | <i>Aulacophora hilaris</i> (COL., Chrysomelidae)  |
| <i>Monoleptophaga caldwelli</i> | <i>Monolepta australis</i> (COL., Chrysomelidae)  |
| <i>Paropsivora australis</i>    | <i>Chrysophtharta bimaculata</i> (COL., Chrysomelidae)  |
| <i>Paropsivora grisea</i>       | <i>Paropsis atomaria</i> (COL., Chrysomelidae)  |
| <i>Paropsivora</i> sp.          | <i>Paropsis</i> sp.   |
| <i>Trigonospila brevifacies</i> | <i>Heliocausta hemiteles</i> [NSWDA] (LEP., Oecophoridae)   |
|                                 | <i>Phthorimaea operculella</i> (LEP., Gelechiidae)  |
| <i>Zenargomyia moorei</i>       | <i>Zenarge turneri</i> (HYM., Argidae)  |

## CAMPYLOCHETINI

- |                 |   |
|-----------------|---|
| <i>Elpe</i> sp. | <i>Ocinara lewinae</i> Lewin [NSWDA] (LEP., Bombycidae) |
|                 | <i>Scoliacma bicolora</i> (LEP., Arctiidae)             |

## CARCELIINI

- |                             |   |
|-----------------------------|---|
| <i>Carcelia cosmophilae</i> | <i>Acantholeucania loreyi</i> , <i>Achaea janata</i> [QDPI], <i>Anomis</i> <i>erosa</i> [QDPI], <i>Anomis flava</i> , <i>Plusia argentifera</i> , <i>Pseudaletia unipuncta</i> (LEP., Noctuidae)      |
|                             | <i>Ialmenus evagoras</i> [QDPI] (LEP., Lycaenidae)  |
|                             | <i>Graphium macleayanus</i> (LEP., Papilionidae)  |
| <i>Carcelia murina</i>      | <i>Anthela varia</i> [NSWDA], <i>Anthela</i> sp. (LEP., Anthelidae)   |
| <i>Carcelia noctuae</i>     | <i>Anomis flava</i> , <i>Anticarsia irrorata</i> , <i>Euxoa radians</i> [QDPI], <i>Heliothis armigera</i> , <i>Heliothis punctigera</i> [QDPI], <i>Pseudaletia unipuncta</i> [QDPI] (LEP., Noctuidae) |
| <i>Carcelia</i> sp.         | <i>Orgyia anartoides</i> [NSWDA] (LEP., Lymantriidae)   |
| <i>Carcelia</i> sp.         | <i>Tisiphone</i> sp. (LEP., Nymphalidae)  |
| <i>Carcelia</i> sp.         | <i>Delias aganippe</i> [NSWDA] (LEP., Pieridae)   |
| <i>Carcelimyia dispar</i>   | <i>Ochrogaster contraria</i> , <i>Ochrogaster</i> sp. (LEP., Notodontidae)  |
|                             | <i>Panacela lewinae</i> [NSWDA] (LEP., Eupterotidae)  |

## ERNESTIINI

*Chlorotachina* sp. n.*Hesperilla* sp. (LEP., HesperIIDae)

## ERYCIINI

*Aplomya* sp. ? *flavisquama**Aplomya* sp.*Bactromyiella ficta**Bactromyiella* ? *ficta**Chlorogastropsis orga**Pseudalsomyia pilifacies**Teretrophora fasciata**Teretrophora* sp.

Undetermined genus (near

*Chlorogastropsis*) 1

Undetermined genus (near

*Chlorogastropsis*) 2

Undetermined genus

Undetermined genus

*Erysichton lineata lineata* [QDPI] (LEP., Lycaenidae)*Nacaduba biocellata biocellata* (LEP., Lycaenidae)*Nacoleia octasema*, unidentified sp. (LEP., Pyralidae)*Dasybasis hebes*, *Dasybasis oculata* (DIPT., Tabanidae)  
[Spratt & Wolf, 1972]*Metura elongata* (LEP., Psychidae)

Unidentified cerambycid (COL.)

*Arachnographa micrastrella*, *Heliocausta hemiteles* [NSWDA],*Philobota facialis* (LEP., Oecophoridae)*Plectophila discalis* (LEP., Xyloryctidae)*Araeostoma aenicta* (LEP., Xyloryctidae)*Procometis* sp. [WARI] (LEP., Xyloryctidae)*Pollanisus viridipulverulentus* (LEP., Zygaenidae)'Light Brown Apple Moth' (LEP., ? *Epiphyas postvittana*,  
Tortricidae)

## ETHILLINI

*Ethilla translucens**Scoliacma bicolora* (LEP., Arctiidae)*Terpna* sp. (LEP., Geometridae)*Ethilla* sp.*Anisozyga pieroides* [QDPI] (LEP., Geometridae)

## EXORISTINI

*Austrophorocera* sp.*Doratifera casta*, [NSWDA], *Doratifera vulnerans* [NSWDA],*Doratifera* sp. (LEP., Limacodidae)*Eozenillia remota**Anthela ariprepes* [NSWDA] (LEP., Anthelidae)*Exorista coras**Hyalarcta huebneri*, *Hyalarcta nigrescens* (LEP., Psychidae)*Exorista curriei**Pseudomantis albofimbriata* [NSWDA] (MANT., Mantidae)*Heliothis armigera*, *Heliothis punctigera* (LEP., Noctuidae)*Exorista flaviceps**Ipanica cornigera* (LEP., Agaristidae)*Acyphyas leucomelas* [WARI] (LEP., Lymantriidae)*Pterolocera* sp. (LEP., Anthelidae)*Pieris rapae* (LEP., Pieridae)*Roeselia metallopa* (LEP., Nolidae)*Exorista mungomeryi**Heliothis punctigera* [NSWDA, QDPI], *Spodoptera exempta*,  
*Spodoptera mauritia* (LEP., Noctuidae)

Unidentified psychid (LEP.)

*Exorista psychidivora**Anomis planalis* [QDPI], *Anomis flava* [QDPI], *Spodoptera exempta* [NSWDA] (LEP., Noctuidae)*Exorista sorbillans**Doleschallia bisaltide australis* (LEP., Nymphalidae) [Malloch  
1929b : 332]*Ialmenus evagoras* [QDPI] (LEP., Lycaenidae)

Numerous other LEP. hosts in extra-Australian regions

*Exorista* spp.*Animula herrichi* [NSWDA], *Hyalarcta huebneri* (LEP.,  
Psychidae)*Leptocneria reducta* [NSWDA] (LEP., Lymantriidae)*Loxostege* sp. [QDPI] (LEP., Pyralidae)*Ochrogaster contraria* (LEP., Notodontidae)*Phalaenoides glycine* [NSWDA] (LEP., Agaristidae)

- Spoggosia* sp. n.  
*Stomatomyia tricholygoides*
- Anthela excellens* (LEP., Anthelidae)  
*Amata* sp. ? *aperta* [NSWDA] (LEP., Amatidae)  
*Loxostege affinitalis* [NSWDA] (LEP., Pyralidae)  
*Pseudaletia convecta*, *Pseudaletia unipuncta* [NSWDA],  
*Spodoptera exempta* (LEP., Noctuidae)
- GONIINI
- Goniophthalmus australis*  
*Goniophthalmus rufescens*
- Heliothis armigera*, *Heliothis* sp., *Pseudaletia* sp. [QDPI],  
*Spodoptera exempta*, *Spodoptera mauritia* (LEP., Noctuidae)  
*Neocleptria punctifera* [NSWDA], *Pandesma quenavadi*  
(LEP., Noctuidae)
- LESKIINI
- Apatemyia* sp.  
*Demoticoides pallidus*  
*Sipholeskia* sp. ? *certima*
- Unidentified curculionid larva (COL.)  
‘Cedar Shoot Borer’ (LEP.)  
*Lygropia clytusalis* (LEP., Pyralidae)
- LEUCOSTOMATINI
- Leucostoma simplex*
- Nysius vinitor* (HEM., Lygaeidae)
- LINNAEMYINI
- Chaetophthalmus bicolor*  
*Chaetophthalmus biseriatus*
- Agrotis ipsilon*, *Pseudaletia unipuncta* (LEP., Noctuidae)  
*Heliothis armigera*, *Heliothis punctigera*, *Heliothis* sp.  
[QDPI], *Pseudaletia convecta* (LEP., Noctuidae)  
*Nyctemera amica*, *Utetheisa pulchelloides* (LEP., Arctiidae)  
*Euxoa radians* (LEP., Noctuidae)  
*Agrotis munda*, *Heliothis punctigera*, *Heliothis* sp. [NSWDA,  
QDPI], *Persectania ewingii* [NSWDA], *Pseudaletia convecta*  
[NSWDA] (LEP., Noctuidae)  
*Pseudaletia unipuncta* (LEP., Noctuidae)  
*Maruca testulalis* [QDPI] (LEP., Pyralidae)
- Chaetophthalmus pallipes*  
*Chaetophthalmus* spp.
- Linnaemya concavicornis*  
*Linnaemya* sp.
- MINTHOINI
- Minthoria dasyops*
- Barea consignatella* (LEP., Oecophoridae)
- NEAERINI
- Voriella uniseta*
- Cydia molesta* [NSWDA], *Epiphyas postvittana* (LEP.,  
Tortricidae)  
Undescribed gen. & sp. (QLD) ‘Soya Bean Leaf Tier’ (LEP., ? Pyralidae)  
Undetermined genus, sp. n. *Procometis* sp. (LEP., Xyloryctidae)
- NEMORAEINI
- Nemoraea* sp. n.
- Theretra nessus* [NSWDA] (LEP., Sphingidae)
- PALPOSTOMATINI
- Palpostoma aldrichi*  
*Palpostoma desvoidyi*  
*Palpostoma flavum*  
*Palpostoma testaceum*
- Dermolepida albohirta* (COL., Scarabaeidae)  
*Lepidiota frenchi* (COL., Scarabaeidae)  
*Anoplostethus opalinus* (COL., Scarabaeidae)  
*Dermolepida albohirta*, *Heteronychus arator*, *Lepidiota*  
*caudata*, *Metanastes vulgivagus*, *Pseudholophylla fur-*  
*furacea* (COL., Scarabaeidae)  
*Palpostoma* spp. *Anomalophylla* sp. [Hardy, 1938], *Lepidiota trichosterna*  
[Hardy, 1938], *Metanastes vulgivagus*, *Pseudholophylla*  
*furfuracea* [Hardy, 1938]

## PHASIINI

*Alophora aureiventris*  
*Alophora lepidofera*  
*Besserioides varicolor*

*Dysdercus sidae* (HEM., Pyrrhocoridae)  
*Nysius vinitor* (HEM., Lygaeidae)  
*Dysdercus sidae* (HEM., Pyrrhocoridae)

## PROSENIINI

*Platytaenia maculata*  
*Prosenia nigripes*

Unidentified cerambycid (COL.)  
*Dermolepida albohirta* (COL., Scarabaeidae)

## RUTILIINI

*Amphibolia ignorata*

Unidentified melolonthine chafer grubs (COL., Scarabaeidae) [Paramonov, 1968]

*Rutilia* s.l. spp.

*Anoplognathus* spp., *Dasygnathus* sp., *Dermolepida* sp., *Lepidiota* spp., (COL., Scarabaeidae) [From scattered literature references: identities of *Rutilia* species all suspect]

## SIPHONINI

*Actia eucosmae*  
*Ceromya norma*  
*Ceromya parviseta*  
*Ceromya* sp. ? *fergusoni*  
*Peribaea argentifrons*

*Crociosema plebeiana* (LEP., Tortricidae)  
*Pseudaletia convecta* [NSWDA] (LEP., Noctuidae)  
*Isotenes miserana* [NSWDA] (LEP., Tortricidae)  
 Unidentified geometrid (LEP.)  
*Copromorpha prasinochroa* [NSWDA] (LEP., Copromorphidae)

*Peribaea orbata*

*Homoeosoma vagella* (LEP., Pyralidae)  
*Acantholeucania loreyi*, *Heliothis* sp. [QDPI], *Pseudaletia unipuncta*, *Spodoptera exempta*, *Spodoptera litura* (LEP., Noctuidae)

*Peribaea plebeia*  
*Peribaea* sp. ? *plebeia*  
*Peribaea* sp.

*Earias huegeli* (LEP., Noctuidae)  
 ? *Anthela* sp. [NSWDA] (LEP., Anthelidae)  
*Homoeosoma vagella* [QDPI] (LEP., Pyralidae)

## STURMIINI

*Anamastax* sp. n.  
*Blepharipa fulviventris*

*Panacela lewiniae* (LEP., Eupterotidae)  
*Anthela varia* (LEP., Anthelidae)  
*Hippotion celerio*, *Theretra nessus* [NSWDA] (LEP., Sphingidae)

*Delias argenthona* [QDPI] (LEP., Pieridae)  
*Papilio aegaeus*, *Papilio anactus*, *Papilio* sp. LEP., Papilionidae)

*Blepharipa* spp.

*Anthela varia*, *Anthela* sp. (LEP., Anthelidae)  
*Agrius convolvuli*, *Chromis erotus*, *Hippotion celerio*, *Theretra nessus* [NSWDA] (LEP., Sphingidae)

*Orgyia anartoides* (LEP., Lymantriidae)  
*Plusia* sp. (LEP., Noctuidae)  
*Graphium sarpedon* [NSWDA] (LEP., Papilionidae)

*Eurygastropsis tasmaniae*  
*Palexorista bancrofti*  
*Palexorista macquarti*  
*Palexorista solennis*

*Plusia* sp. (LEP., Noctuidae)  
 Unidentified pyralid (LEP.)  
*Doratifera* sp. (LEP., Limacodidae)  
*Pseudaletia convecta* [QDPI], *Spodoptera* sp. [QDPI] (LEP., Noctuidae)

*Palexorista subanajama*

*Acantholeucania loreyi* (LEP., Noctuidae)

<i>Palexorista</i> spp.	<i>Apina callisto</i> (LEP., Agaristidae) <i>Spilosoma glatignyi</i> (LEP., Arctiidae) <i>Entometa australasiae</i> (LEP., Lasiocampidae) <i>Doratifera casta</i> (LEP., Limacodidae) <i>Habrophylla euryzona</i> (LEP., Lymantriidae) <i>Heliothis</i> sp. [QDPI], <i>Persectania ewingii</i> , <i>Plusia</i> sp. [QDPI], <i>Pseudaletia convecta</i> , <i>Pseudaletia unipuncta</i> [QDPI], <i>Spodoptera exempta</i> [NSWDA] (LEP., Noctuidae) <i>Archernis mitis</i> [NSWDA], <i>Loxostege affinitalis</i> [QDPI], <i>Maruca testulalis</i> [QDPI] (LEP., Pyralidae) Unidentified sphingid (LEP.) <i>Merophyas divulsana</i> [WARI] (LEP., Tortricidae) <i>Plusia argentifera</i> (LEP., Noctuidae) <i>Danaus plexippus</i> [QDPI], <i>Euploea core corinna</i> (LEP., Nymphalidae) <i>Delias aganippe</i> (LEP., Pieridae) <i>Margaronia hyalinata</i> (LEP., Pyralidae) Unidentified LEP. [NSWDA] Unidentified LEP. [McFarland Ref. N. 114] <i>Hymenia recurvalis</i> [NSWDA] (LEP., Pyralidae) <i>Brithys crini</i> [QDPI] (LEP., Noctuidae) <i>Danaus plexippus</i> (LEP., Nymphalidae) <i>Agrius convolvuli</i> [QDPI] (LEP., Sphingidae) <i>Precis villida</i> (LEP., Nymphalidae) <i>Acantholeucania loreyi</i> , <i>Euxoa</i> sp. [NSWDA], <i>Persectania ewingii</i> , <i>Pseudaletia convecta</i> , <i>Pseudaletia unipuncta</i> (LEP., Noctuidae) <i>Agrotis infusa</i> [NSWDA], <i>Agrotis ipsilon</i> [QDPI], <i>Euxoa radians</i> , <i>Heliothis punctigera</i> [QDPI], <i>Persectania ewingii</i> [NSWDA] (LEP., Noctuidae) <i>Pterolocera</i> sp. (LEP., Anthelidae) <i>Psilogramma menephron</i> (NSWDA) (LEP., Sphingidae) Numerous other LEP. hosts in extra-Australian regions <i>Heliocausta rufogrisea</i> [NSWDA] (LEP., Oecophoridae) <i>Orgyia anartoides</i> [NSWDA] (LEP., Lymantriidae) <i>Xylorycta luteotactella</i> (LEP., Xyloryctidae)
<i>Paradrino laevicula</i>	
<i>Polychaeta nigra</i>	
<i>Polychaeta</i> sp.	
<i>Sisyropa</i> sp.	
<i>Sturmia convergens</i>	
<i>Sturmia</i> sp.	
<i>Tritaxys heterocera</i>	
<i>Tritaxys milias</i>	
<i>Tritaxys</i> sp.	
<i>Zygothria atropivora</i>	
Undetermined genus	
Undetermined genus	
Undetermined genus	

## TACHININI

<i>Cuphocera emmesia</i>	Unidentified LEP. [McFarland Ref. N. 114]
<i>Cuphocera varia</i>	<i>Acantholeucania loreyi</i> , <i>Pseudaletia unipuncta</i> (LEP., Noctuidae) Also <i>Spodoptera</i> spp. in Oriental Region
<i>Microtropesa flaviventris</i>	<i>Persectania ewingii</i> , <i>Pseudaletia convecta</i> [NSWDA] (LEP., Noctuidae)

## TRICHOPODINI

<i>Pentatomophaga bicincta</i>	<i>Amblypelta lutescens</i> (HEM., Coreidae) Also <i>Axiagastus</i> sp. (HEM., Pentatomidae) in New Guinea
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## VORIINI

<i>Hyleorus</i> sp.	<i>Euproctis lutea</i> (LEP., Lymantriidae) Unidentified arctiid larva (LEP.) [QDPI]
<i>Hystricovoria</i> sp.	<i>Armactica columbina</i> , <i>Xanthodes albago</i> (LEP., Noctuidae)

*Voria ruralis**Plusia argentifera* (LEP., Noctuidae)

Numerous other LEP. (also HYM.) hosts in extra-Australian regions

## WINTHEMIINI

*Winthemia lateralis**Spilosoma glatignyi* (LEP., Arctiidae)*Winthemia neowinthemioides**Pseudaletia unipuncta* [NSWDA] (LEP., Noctuidae)*Brithys crini* [QDPI] (LEP., Noctuidae)*Euploea core corinna*, *Euploea* sp., *Danaus plexippus* (LEP., Nymphalidae)*Winthemia trichopareia**Catopsilia pyranthe* (LEP., Pieridae)*Winthemia* spp.*Porela arida* [NSWDA] (LEP., Lasiocampidae)*Anomis flava* [QDPI], *Euxoa* sp. [NSWDA], *Heliothis armigera* [QDPI], *Heliothis* sp. [QDPI], *Pseudaletia convecta* [NSWDA] (LEP., Noctuidae)*Anaphaeis java* [QDPI], *Delias aganippe*, *Delias nigrina* (LEP., Pieridae)

## UNDETERMINED TRIBE

## Undescribed gen. &amp; sp.

*Didymuria violescens* (PHASM., Phasmatidae)*Tropidoderus childrenii* (PHASM., Phasmatidae)

## UNDETERMINED TRIBE

## Undescribed gen. &amp; sp.

*Heteronympha merope merope* (LEP., Nymphalidae)

[McFarland Ref. Ny. 33]

## HOST-PARASITE LIST

The host orders, and families within each order, are arranged alphabetically. Host species within each family are arranged in alphabetical order of their valid binomina, and the author's name is given for each host species. The tachinid parasites known for each host are given in alphabetical order of their valid binomina, the names always corresponding with those considered valid in the taxonomic catalogue (Part II); subfamily and tribal placements and authors' names are omitted for the tachinid parasites as they can all be found easily, if required, from the taxonomic catalogue, and the tribal positions are clear also from the 'parasite-host list' (beginning on p. 171).

The well-known generic instability in the Lepidoptera imposes the need to provide additional names for the lepidopterous hosts that help to link the binomina that are currently considered valid with those that actually appear in literature references or on the data labels attached to reared tachinid specimens. Whenever necessary earlier generic combinations for the host species are shown in square brackets on a separate line immediately below the presently valid name. Similarly, when the specific name that has been in use is now supplanted by a valid senior synonym the supplanted name is shown in square brackets. In a very few instances the whole binomen has changed, in which case the whole former binomen is indicated in square brackets.

*Hosts**Tachinid Parasites*Order **COLEOPTERA**

## CERAMBYCIDAE

## Unidentified larvae

*Platytainia maculata*, *Pseudalsomyia pilifacies*

## CHRYSEMELIDAE

*Aulacophora hilaris* Boisduval  
*Chrysophtharta bimaculata* Olivier  
*Monolepta australis* Jacoby  
 [M. rosea Blackburn]  
*Paropsis atomaria* Olivier  
 [P. reticulata Marsh]  
*Paropsis* sp.  
 Unidentified spp.

*Medinodexia morgani*  
*Paropsivora australis*  
*Monoleptophaga caldwelli*  
  
*Anagonia anguliventris*, *Froggattimyia*  
*tillyardi*, *Paropsivora grisea*  
*Paropsivora* sp.  
*Anagonia lateralis*, *Anagonia scutellata*

## CURCULIONIDAE

*Bryachus squamicollis* Pascoe  
*Gonipterus scutellatus* Gyllenhal  
*Rhabdoscelus obscurus* Boisduval  
 [Rhabdocnemis obscura]  
 Unidentified larva

*Anagonia lateralis*  
*Anagonia lasiophthalma*  
*Lixophaga sphenophori*  
  
*Apatemyia* sp.

## SCARABAEIDAE

*Anomalophylla* sp.  
*Anoplognathus* spp.  
*Anoplostethus opalinus* Brullé  
*Dasygnathus* sp.  
*Dermolepida albohirta* Waterhouse  
 [Lepidoderma albohirtum]  
*Heteronychus arator* Fabricius  
 [H. sanctaehelenae Blanchard]  
*Lepidiota caudata* Blackburn  
*Lepidiota frenchi* Blackburn  
*Lepidiota trichosterna* Lea  
*Lepidiota* spp.  
*Metanastes vulgivagus* Olliff  
 [M. blackburni Arrow]  
*Pseudoholophylla furfuracea* Burmeister  
 Unidentified melolonthine larvae

*Palpostoma* sp.  
*Rutilia* s.l. spp.  
*Palpostoma flavum*  
*Rutilia* s.l. sp.  
*Palpostoma aldrichi*, *Palpostoma testaceum*,  
*Prosenia nigripes*  
*Palpostoma testaceum*  
  
*Palpostoma testaceum*  
*Palpostoma desvoidyi*  
*Palpostoma* sp.  
*Rutilia* s.l. spp.  
*Palpostoma testaceum*, *Palpostoma* sp.  
  
*Palpostoma testaceum*, *Palpostoma* sp.  
*Amphibolia ignorata* Paramonov

## Order DIPTERA

## TABANIDAE

*Dasybasis hebes* Walker  
*Dasybasis oculata* Ricardo

*Bactromyiella* ? ficta  
*Bactromyiella* ? ficta

## Order HEMIPTERA

## COREIDAE

*Amblypelta lutescens* Distant

*Pentatomophaga bicincta*

## LYGAEIDAE

*Nysius vinitor* Bergroth

*Alophora lepidofera*, *Leucostoma simplex*

## PYRRHOCORIDAE

*Dysdercus sidae* Montrouzier

*Alophora aureiventris*, *Besserioides varicolor*

Order **HYMENOPTERA**

## ARGIDAE

*Zenarge turneri* Rohwer*Zenargomyia moorei*

## PERGIDAE

*Lophyrotoma* sp.[*Platypsectra* sp.]*Perga dorsalis* Leach*Perga glabra* Kirby*Pterygophorus analis* Costa

Unidentified pergid

*Froggattimyia hirta**Froggattimyia nicholsoni**Froggattimyia hirta**Froggattimyia hirta**Froggattimyia wentworthi*

## VESPIDAE

*Polistes tasmaniensis* Saussure*Polistes* sp.*Polistes* sp.*Polistes* sp.*Ropalidia marginata jucunda* Cameron*Anacamptomyia nigriventris**Anacamptomyia nigriventris**Euvespivora decipiens**Koralliomysia* sp.*Koralliomysia* sp.Order **LEPIDOPTERA**

## AGARISTIDAE

*Apina callisto* Walker*Ipanica cornigera* Butler*Phalaenoides glycine* Lewin[*Agarista* g.]*Palxorista* sp.*Exorista curriei**Exorista* sp.

## AMATIDAE

*Amata* ? *aperta* Walker[*Syntomis* ? *a.*]*Stomatomyia tricholygoides*

## ANTHELIDAE

*Anthela ariprepes* Turner*Anthela excellens* Walker*Anthela varia* Walker*Anthela* sp.[*Darala* sp.]? *Anthela* sp.*Eozenillia remota**Spoggosia* sp. n.*Blepharipa fulviventris*, *Blepharipa* sp., *Carcelia murina**Carcelia murina**Peribaea* sp. ? *plebeia*

## ARCTIIDAE

*Nyctemera amica* White*Scoliacma bicolora* Boisduval[*Scolisoma* b.]*Spilosoma glatignyi* Le Guilleau*Utetheisa pulchelloides* Hampson

Unidentified arctiid

*Chaetophthalmus biseriatus**Elpe* sp., *Ethilla translucens**Palxorista* sp., *Winthemia lateralis**Chaetophthalmus biseriatus**Hyleorus* sp.

## BOMBYCIDAE

*Ocinara lewinae* Lewin*Elpe* sp.

## COPROMORPHIDAE

*Copromorpha prasinochroa* Meyrick*Peribaea argentifrons*

## EUPTEROTIDAE

*Panacula lewinae* Lewin*Anamastax* sp. n., *Carcelimyia dispar*

## GELECHIIDAE

*Phthorimaea operculella* Zeller  
[*Gnorimoschema* o.]*Trigonospila brevifacies*

## GEOMETRIDAE

*Anisozya pieroides* Walker  
[*Eucyclodes* p.]  
Unidentified geometrid*Ethilla* sp.*Ceromya* sp. ? *fergusoni*

## HESPERIIDAE

*Hesperilla* sp.*Chlorotachina* sp. n.

## LASIOCAMPIDAE

*Entometa australasiae* Fabricius  
[*Digglesia* a.]  
*Porela arida* Walker*Palexorista* sp.*Winthemia trichopareia*

## LIMACODIDAE

*Doratifera casta* Scott  
*Doratifera vulnerans* Lewin  
*Doratifera* sp.*Austrophorocera* sp., *Palexorista* sp.  
*Austrophorocera* sp., *Compsilura concinnata*  
*Austrophorocera* sp., *Palexorista macquarti*

## LYCAENIDAE

*Erysichton lineata lineata* Murray  
*Ialmenus evagoras* Donovan  
*Nacaduba biocellata biocellata* Felder*Aplomya* sp. ? *flavisquama*  
*Carcelia cosmophilae*, *Exorista sorbillans*  
*Aplomya* sp.

## LYMANTRIIDAE

*Acyphyas leucomelas* Walker  
*Euproctis lutea* Fabricius  
[*Porthesia* l.]  
*Habrophylla euryzona* Lower  
*Leptocneria reducta* Walker  
[*Lymantria* r.]  
*Orgyia anartoides* Walker  
[*Teia* a.]*Exorista flaviceps*  
*Hyleorus* sp.*Palexorista* sp.  
*Exorista* sp.*Blepharipa* sp., *Carcelia* sp., undetermined  
sturmiine genus

## NOCTUIDAE

*Acantholeucania loreyi* Duponchel  
[*Cirphis* l.]  
*Achaea janata* Linnaeus  
*Agrotis infusa* Boisduval  
*Agrotis ipsilon* Hufnagel  
[*Rhyacia* i.]*Carcelia cosmophilae*, *Cuphocera varia*, *Palexorista*  
*subanajama*, *Peribaea orbata*, *Tritaxys heterocera*  
*Carcelia cosmophilae*  
*Tritaxys milias*  
*Chaetophthalmus bicolor*, *Tritaxys milias*

- Agrotis munda* Walker  
*Anomis erosa* Hübner  
     [*Cosmophila e.*]  
*Anomis flava* Fabricius  
     [*Cosmophila f.*]  
*Anomis planalis* Swinhoe  
     [*Antarchaea chionosticta* Atherton]  
*Anomis xanthindyma* Boisduval  
     [*Cosmophila x.*]  
*Anticarsia irrorata* Fabricius  
*Armactica columbina* Walker  
*Brithys crini* Fabricius  
  
*Earias huegeli* Rogenhofer  
*Euxoa radians* Guenée  
  
*Euxoa* sp.  
*Heliothis armigera* Hübner  
     [*H. obsoleta* misident.]  
  
*Heliothis punctigera* Walker  
  
*Heliothis* spp.  
  
*Neocleptria punctifera* Walker  
*Pandesma quenavadi* Guenée  
*Persectania ewingii* Westwood  
  
*Plusia argentifera* Guenée  
  
*Plusia* sp.  
  
*Pseudaletia convecta*  
  
*Pseudaletia unipuncta* Haworth  
     [*Cirphis u.*]  
  
*Spodoptera exempta* Walker  
     [*Laphygma e.*]  
  
*Spodoptera litura* Fabricius  
     [*Prodenia l.*]  
*Spodoptera mauritia* Boisduval  
*Spodoptera* spp.  
*Xanthodes albago* Fabricius  
     [*Acontia malvae* Hübner]
- Chaetophthalmus* sp.  
*Carcelia cosmophilae*  
  
*Carcelia cosmophilae*, *Carcelia noctuae*, *Exorista sorbillans*, *Winthemias* sp.  
*Exorista sorbillans*  
  
*Compsilura concinnata*  
  
*Carcelia noctuae*  
*Hystricovoria* sp.  
*Compsilura concinnata*, *Sturmia convergens*,  
     *Winthemias neowinthemioides*  
*Peribaea plebeia*  
*Carcelia noctuae*, *Chaetophthalmus pallipes*,  
     *Tritaxys milias*  
*Tritaxys heterocera*, *Winthemias* sp.  
*Carcelia noctuae*, *Chaetophthalmus biseriatus*,  
     *Exorista curriei*, *Goniophthalmus australis*,  
     *Winthemias* sp.  
*Carcelia noctuae*, *Chaetophthalmus biseriatus*,  
     *Chaetophthalmus* sp., *Exorista curriei*, *Exorista mungomeryi*  
*Chaetophthalmus biseriatus*, *Goniophthalmus australis*, *Pallexorista* sp., *Peribaea orbata*,  
     *Winthemias* sp.  
*Goniophthalmus rufescens*  
*Goniophthalmus rufescens*  
*Chaetophthalmus* sp., *Microtropesa flaviventris*,  
     *Pallexorista* sp., *Tritaxys heterocera*, *Tritaxys milias*  
*Carcelia cosmophilae*, *Paradrino laevicula*, *Voria ruralis*  
*Blepharipa* sp., *Eurygastropsis tasmaniae*,  
     *Pallexorista* sp.  
*Ceromya norma*, *Chaetophthalmus biseriatus*,  
     *Chaetophthalmus* sp., *Microtropesa flaviventris*,  
     *Pallexorista solennis*, *Pallexorista* sp., *Stomatomyia tricholygoides*, *Tritaxys* sp., *Winthemias* sp.  
*Carcelia cosmophilae*, *Carcelia noctuae*, *Chaetophthalmus bicolor*, *Cuphocera varia*, *Linnaemya concavicornis*, *Pallexorista* sp., *Peribaea orbata*,  
     *Stomatomyia tricholygoides*, *Tritaxys heterocera*, *Winthemias lateralis*  
*Exorista mungomeryi*, *Exorista sorbillans*,  
     *Goniophthalmus australis*, *Pallexorista* sp.,  
     *Peribaea orbata*, *Stomatomyia tricholygoides*  
*Peribaea orbata*  
  
*Exorista mungomeryi*, *Goniophthalmus australis*  
*Compsilura concinnata*, *Pallexorista solennis*  
*Hystricovoria* sp.

## NOLIDAE

*Roeselia metallopa* Meyrick  
[*Nola m.*]

*Exorista flaviceps*

## NOTODONTIDAE

*Ochrogaster contraria* Walker  
*Ochrogaster* sp.

*Carcelimyia dispar*, *Exorista* sp.  
*Carcelimyia dispar*

## NYMPHALIDAE

*Danaus plexippus* Linnaeus  
*Doleschallia bisaltide australis* Felder  
*Euploea core corinna* Macleay  
*Euploea* sp.  
*Heteronympha merope merope* Fabricius  
*Precis villida* Fabricius  
*Tisiphone* sp.

*Paradrino laevicula*, *Sturmia convergens*  
*Exorista sorbillans*  
*Paradrino laevicula*, *Winthemia neowinthemioides*  
*Winthemia neowinthemioides*  
Undescribed gen. & sp. (? tribe)  
*Sturmia* sp.  
*Carcelia* sp.

## OECOPHORIDAE

*Arachnographa micrastrella* Meyrick  
*Barea consignatella* Walker  
*Heliocausta hemiteles* Meyrick  
[*Garrha h.*]  
*Heliocausta rufogrisea* Meyrick  
[*Garrha r.*]  
*Philobota facialis* Fabricius

*Teretrophora fasciata*  
*Minthoxia dasyops*  
*Teretrophora fasciata*, *Trigonospila brevifacies*  
Undetermined sturmiine genus  
*Teretrophora fasciata*

## PAPILIONIDAE

*Graphium macleayanus* Leech  
[*Papilio m.*]  
*Graphium sarpedon* Linnaeus  
*Papilio aegaeus* Donovan  
*Papilio anactus* Macleay  
*Papilio* sp.

*Carcelia cosmophilae*  
*Blepharipa* sp.  
*Blepharipa fulviventris*  
*Blepharipa fulviventris*  
*Blepharipa fulviventris*

## PIERIDAE

*Anaphaeis java* Sparrman  
*Catopsilia pyranthe* Linnaeus  
*Delias aganippe* Donovan  
*Delias argenthona* Fabricius  
*Delias nigrina* Fabricius  
*Pieris rapae* Linnaeus

*Winthemia* sp.  
*Winthemia neowinthemioides*  
*Carcelia* sp., *Paradrino laevicula*, *Winthemia* sp.  
*Blepharipa fulviventris*  
*Winthemia* sp.  
*Exorista flaviceps*

## PSYCHIDAE

*Animula herrichi* Westwood  
[*Thyridopteryx h.*]  
*Cryptothoele ignobilis* Walker  
[*Clania i.*]  
*Hyalarcta huebneri* Westwood  
*Hyalarcta nigrescens* Doubleday  
*Metura elongata* Saunders  
[*Oiketicus elongatus*]  
Unidentified psychid

*Exorista* sp.  
Undetermined exoristine genus  
*Eozenillia remota*, *Exorista* sp.  
*Eozenillia remota*  
*Chlorogastropsis orga*  
*Exorista psychidivora*

## PYRALIDAE

*Archernis mitis* Turner  
*Homoeosoma vagella* Zeller  
*Hymenia recurvalis* Fabricius  
*Loxostege affinitalis* Lederer  
*Loxostege* sp.  
*Lygropia clytusalis* Walker  
 [Sylepta c.]  
*Margaronia hyalinata* Linnaeus  
 [Glyphodes h.]  
*Maruca testulalis* Geyer  
*Nacoleia octasema* Meyrick  
 Unidentified pyralids

*Palexorista* sp.  
*Peribaea argentifrons*, *Peribaea* sp.  
*Sisyropa* sp.  
*Palexorista* sp., *Stomatomyia tricholygoides*  
*Exorista* sp.  
*Sipholeskia* sp. ? *certima*  
  
*Paradrino laevicula*  
  
*Linnaemya* sp., *Palexorista* sp.  
*Bactromyiella ficta*  
*Bactromyiella ficta*, *Palexorista bancrofti*

## SPHINGIDAE

*Agrius convolvuli* Linnaeus  
 [Herse c.]  
*Chromis erotus* Cramer  
*Hippotion celerio* Linnaeus  
*Psilogramma menephron* Cramer  
 [Macrosila casuarinae Walker]  
*Theretra nessus* Drury  
  
 Unidentified sphingid

*Blepharipa* sp., *Sturmia convergens*  
  
*Blepharipa* sp.  
*Blepharipa fulviventris*, *Blepharipa* sp.  
*Zygobothria atropivora*  
  
*Blepharipa fulviventris*, *Blepharipa* sp., *Nemoraeta*  
 sp. n.  
*Palexorista* sp.

## TORTRICIDAE

*Archips australana* Lewin  
 [Cacoecia a.]  
*Crociosema plebeiana* Zeller  
*Cydia molesta* Busck  
*Epiphyas postvittana* Walker  
 [Tortrix p.]  
*Isotenes miserana* Walker  
*Merophyas divulsana* Walker

*Compsilura concinnata*  
  
*Actia eucosmae*  
*Voriella uniseta*  
*Voriella uniseta*  
  
*Ceromya parviseta*  
*Palexorista* sp.

## XYLORYCTIDAE

*Araeostoma aenicta* Turner  
  
*Plectophila discalis* Walker  
*Procometis* spp.  
*Xylorycta luteotactella* Walker  
 [Cryptolechia l.]

Undetermined eryciine genus (near *Chloro-*  
*gastropsis*)  
*Teretrophora* sp.  
 Undetermined genera (Eryciini and Neaerini)  
 Undetermined sturmiine genus

## ZYGAENIDAE

*Pollanisus viridipulverulentus*  
 Guérin-Ménéville

Undetermined eryciine genus

## UNDETERMINED FAMILY

*Cuphocera emmesia*, *Polychaeta nigra*, *Polychaeta*  
 sp.

## Order MANTODEA

## MANTIDAE

*Pseudomantis albofimbriata* Stål

*Exorista coras*

Order **ORTHOPTERA**

## ACRIDIDAE

<i>Azelota diversipes</i> Rehn	<i>Ceracia fergusoni</i>
<i>Chortoicetes terminifera</i> Walker	<i>Ceracia fergusoni</i>
<i>Coryphistes longipennis</i> Sjöstedt	<i>Ceracia</i> sp.
<i>Gastrimargus musicus</i> Fabricius	<i>Ceracia</i> sp.
<i>Macrotona australis</i> Walker	<i>Ceracia fergusoni</i>
<i>Urnisa rugosa</i> Saussure	<i>Ceracia fergusoni</i>

## EUMASTACIDAE

<i>Keyacris interpres</i> Rehn	<i>Ceracia fergusoni</i>
<i>Keyacris marcida</i> Rehn	<i>Ceracia fergusoni</i>
<i>Moraba amiculi</i> Sjöstedt	<i>Ceracia fergusoni</i>
<i>Moraba keyi</i> Rehn	<i>Ceracia fergusoni</i>
<i>Moraba misilliformis</i> Rehn	<i>Ceracia fergusoni</i>
<i>Moraba viatica</i> Erichson	<i>Ceracia fergusoni</i>
Many undescribed spp.	<i>Ceracia fergusoni</i>

Order **PHASMATODEA**

## PHASMATIDAE

<i>Didymuria violescens</i> Leach	Undescribed gen. & sp. (? tribe)
<i>Tropidoderus childrenii</i> Gray	Undescribed gen. & sp. (? tribe)

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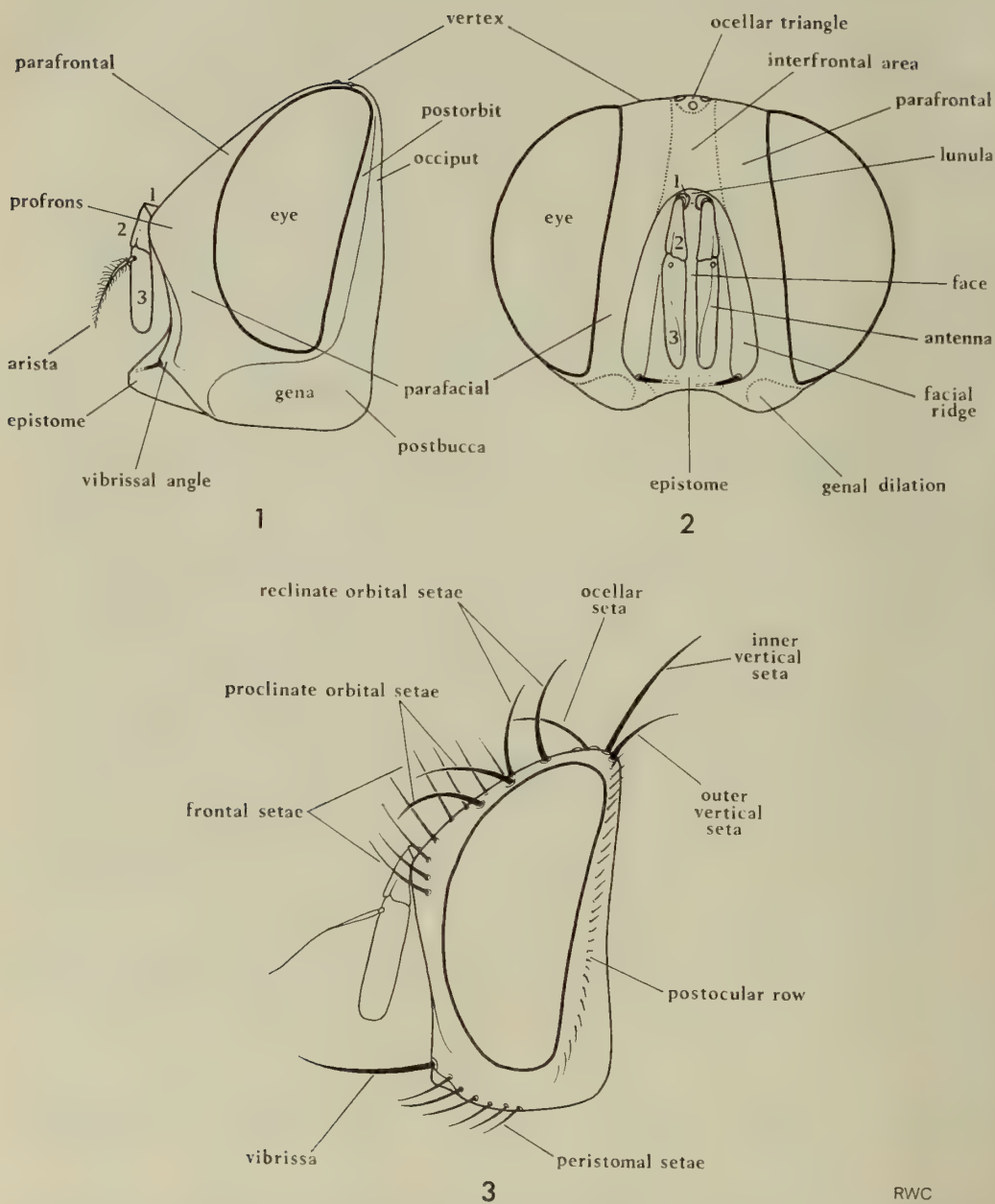
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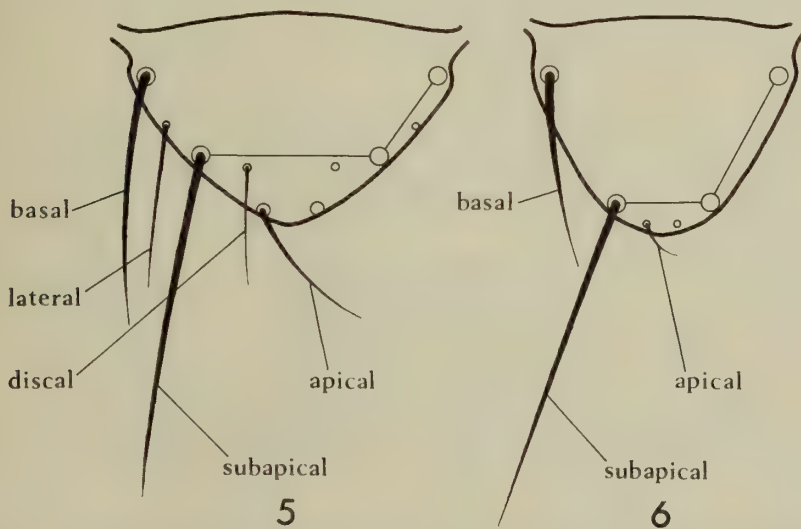
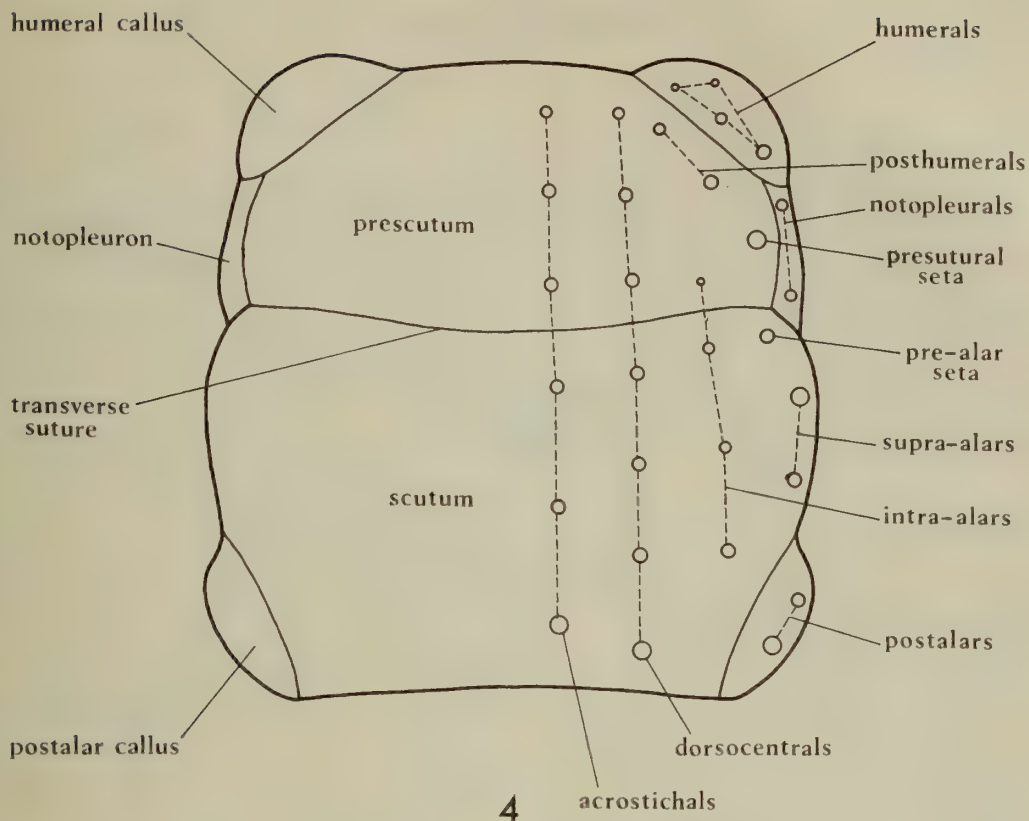
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## ILLUSTRATIONS



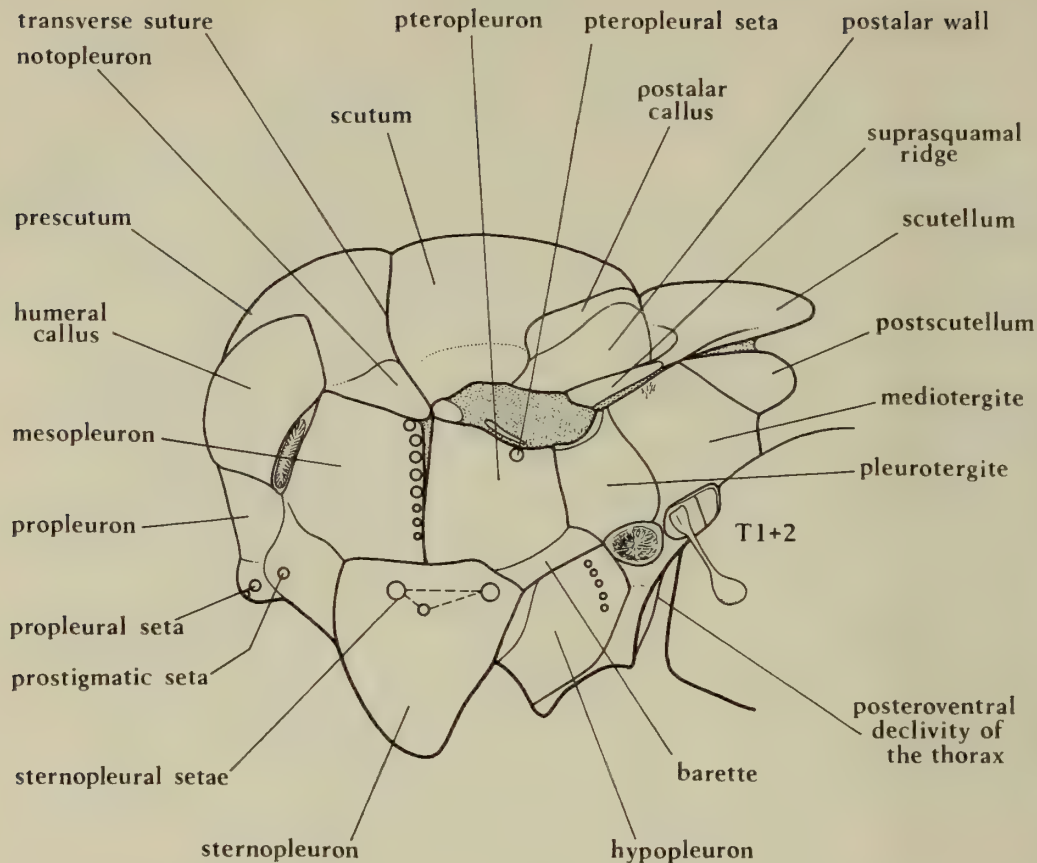
FIGS 1-3. Structure and terminology of the head in typical Tachinidae. 1, left lateral view. 2, facial view. 3, left lateral view showing typical setae. All vestiture omitted in figs 1 and 2 and hairing omitted in fig. 3.

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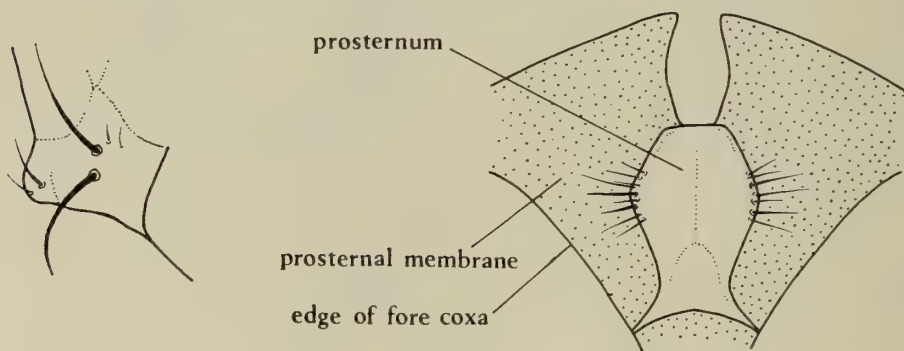


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FIGS 4-6. Terminology of thoracic dorsum in Tachinidae. 4, dorsum of thorax, scutellum omitted, with a complete arrangement of chaetotaxy indicated schematically on one side only. 5 & 6, two typical shapes of scutellum and terminology of scutellar bristling; the straight lines connecting basal and subapical setae illustrate important differences in proportion.



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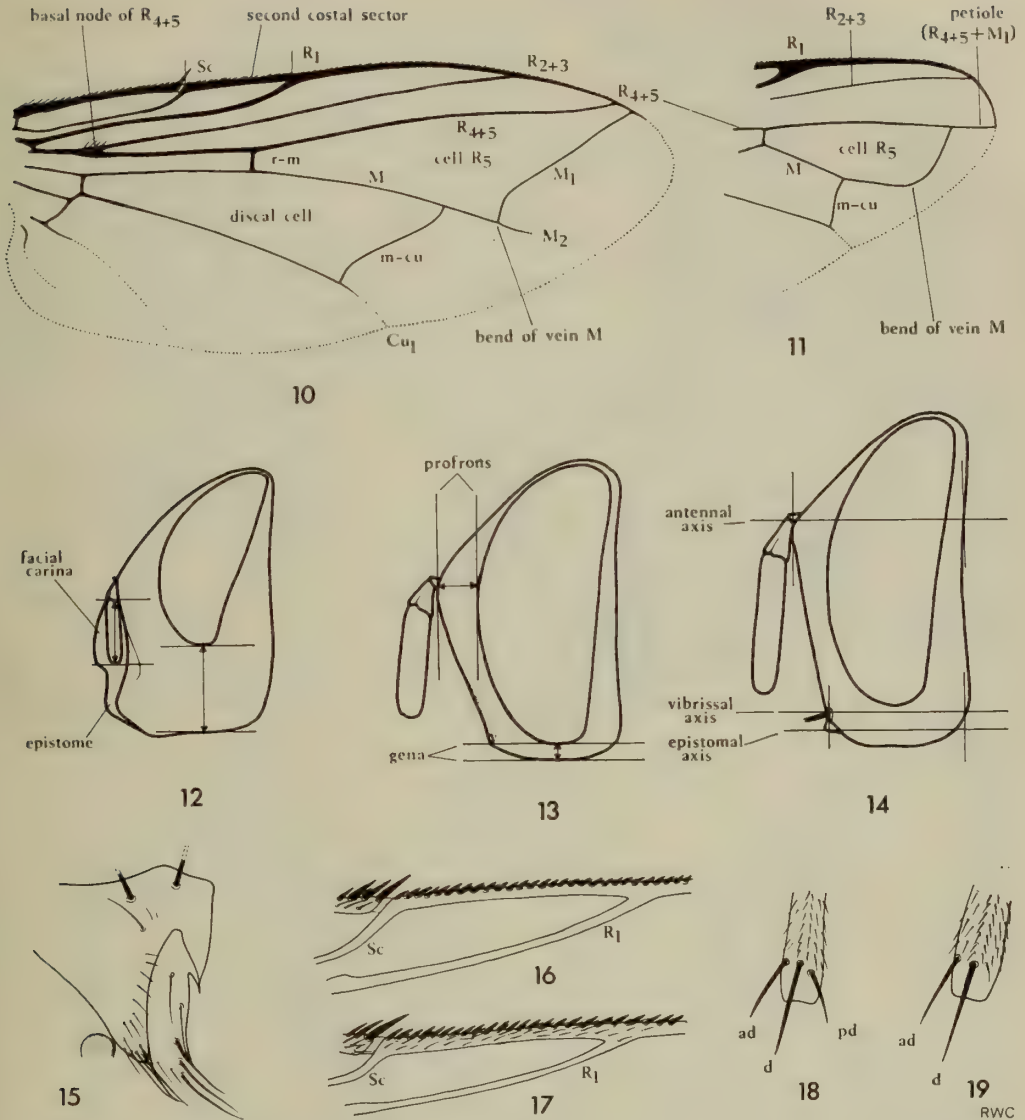


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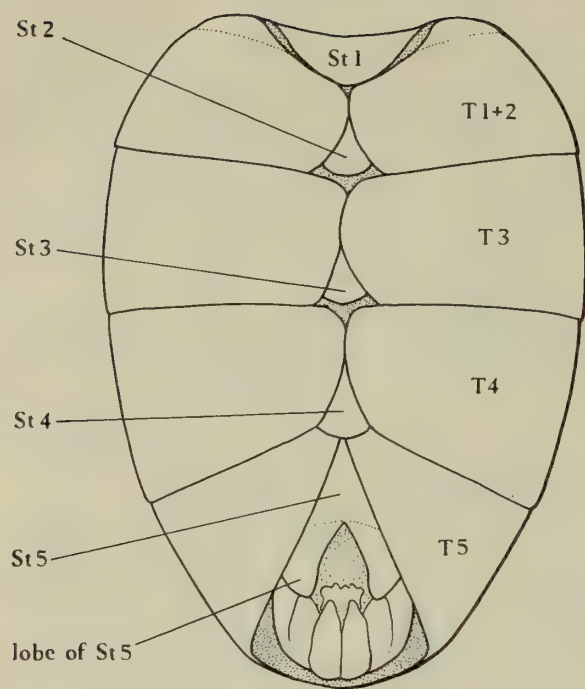
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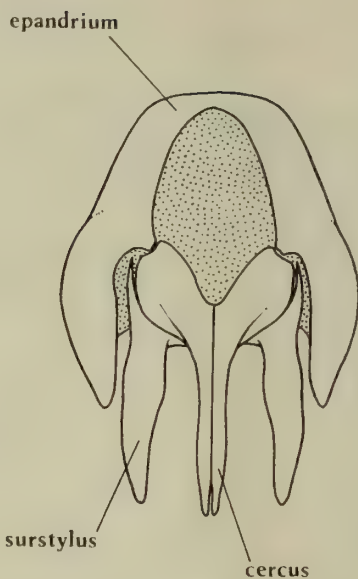
FIGS 7-9. Thoracic characters of Tachinidae. 7, left lateral view of thorax with terminology of sclerites and setae (latter indicated by pore positions only), wing removed. 8, unusual prostigmatic setae in the genus *Peribaea*. 9, prothoracic region, drawn from specimen with setulose prosternum.



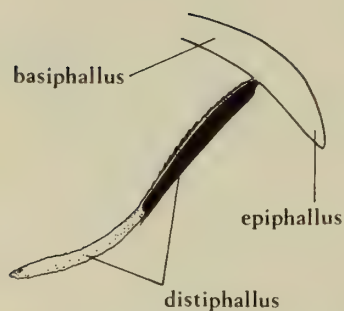
FIGS 10-19. Structural characters of Tachinidae. 10, wing of a species with cell  $R_5$  open and bend of vein  $M$  angulate. 11, apical part of wing of a species with cell  $R_5$  closed and bend of vein  $M$  rounded. 12, head profile in a typical Prosenine with facial carina. 13, head profile in a typical Carceline, showing relative widths of gena and profrons. 14, head profile showing important landmark axes. 15, showing precoxal row of hairs on sternopleuron in genus *Actia*. 16 & 17, ventral view of second costal sector in (16) forms with the sector bare, and (17) forms with the sector haired. 18 & 19, dorsal view of apex of hind tibia in typical forms (18) with an *ad* preapical seta, and (19) without such seta.



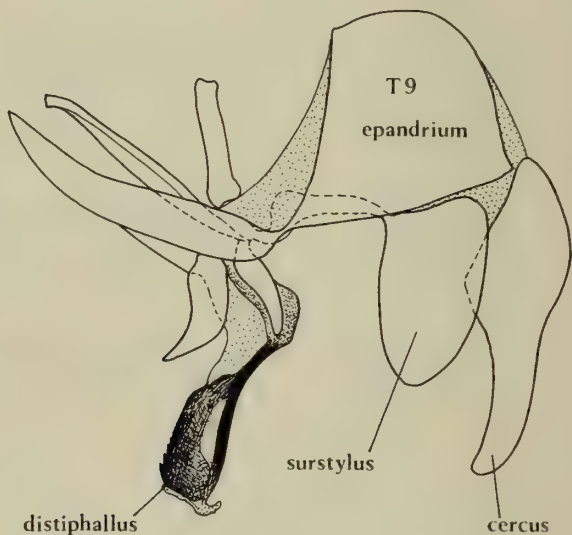
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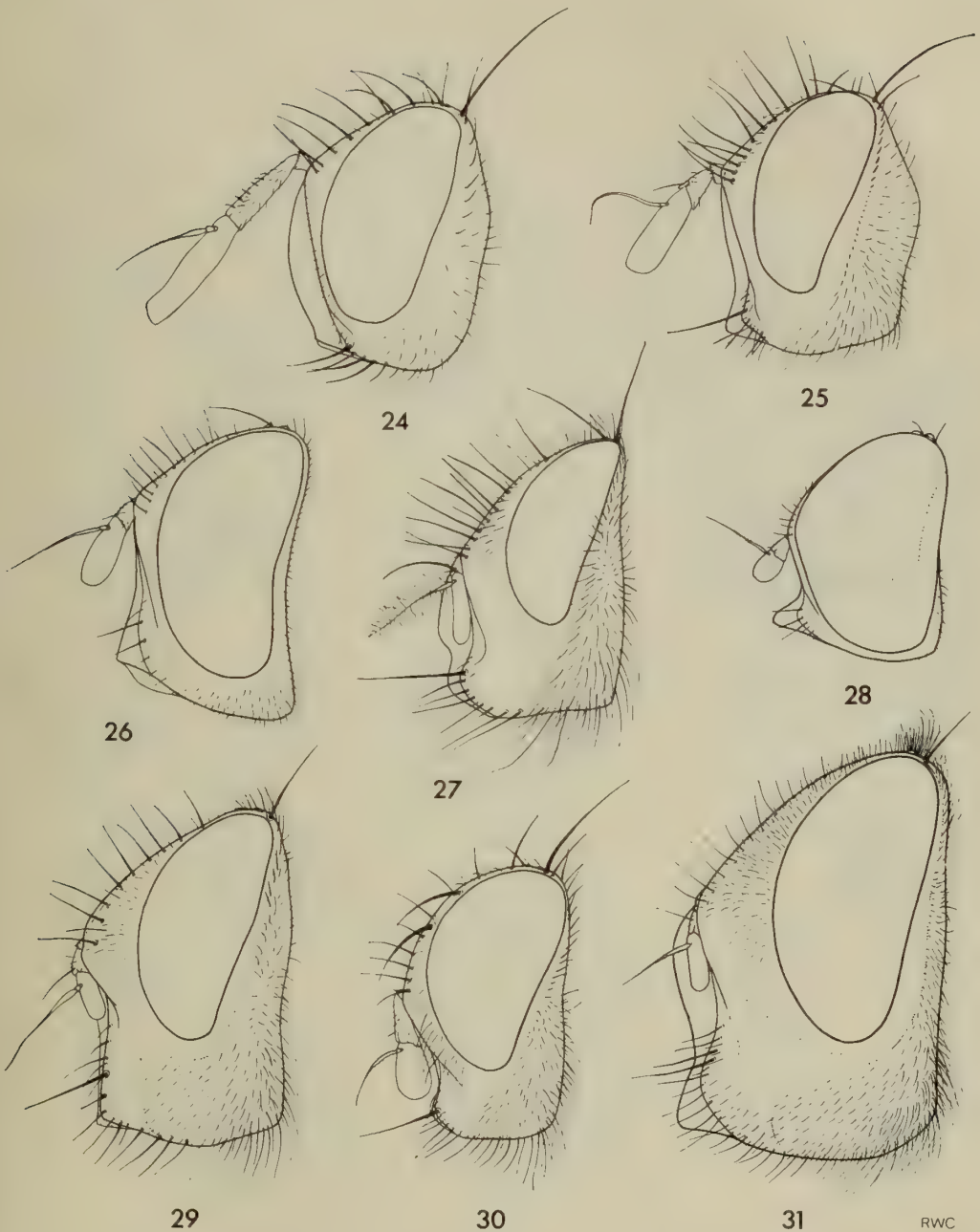
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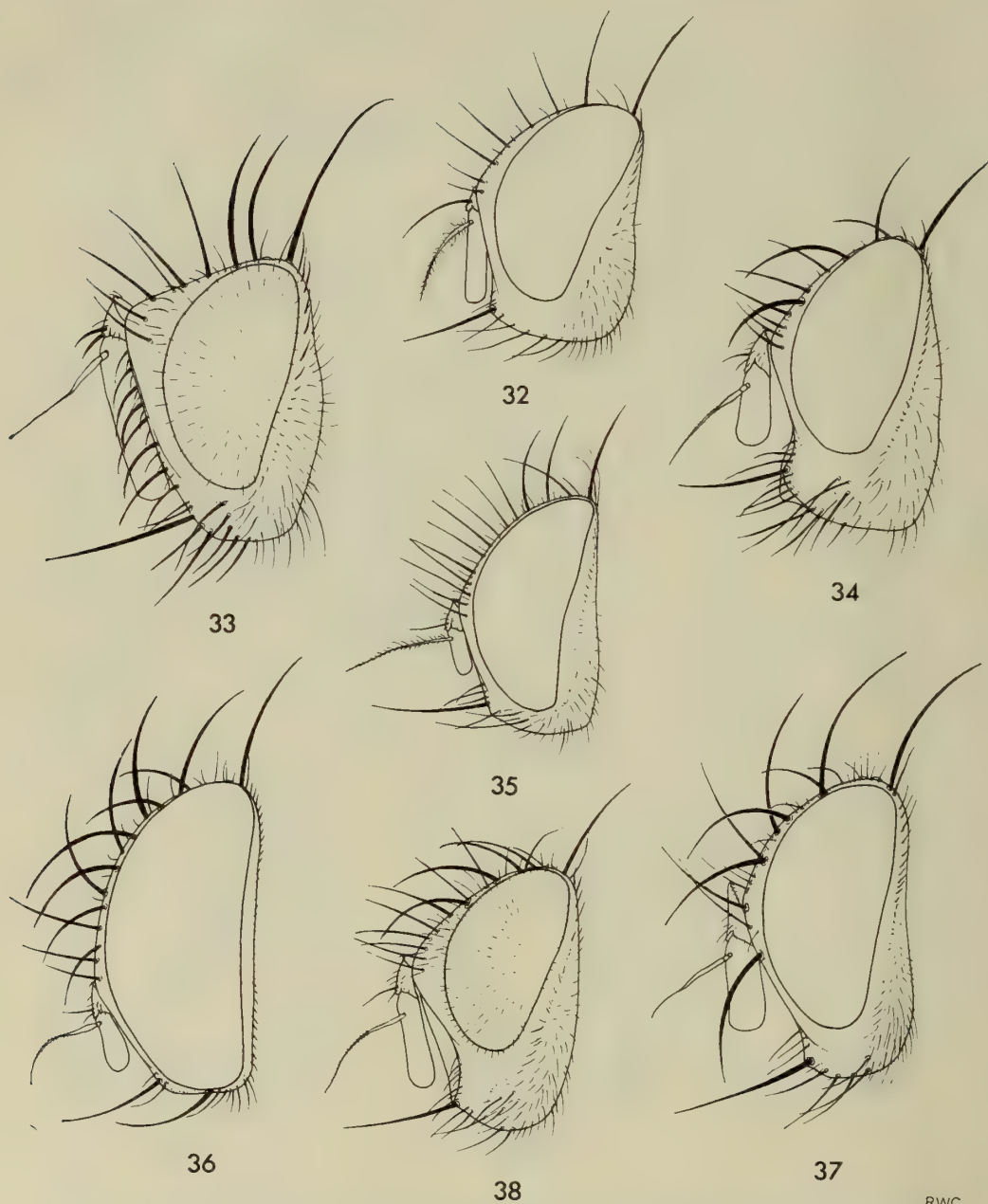
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FIGS 20-23. Abdomen and ♂ genitalia in representative Tachinidae. 20, ventral view of abdomen with numbering of tergites (T) and sternites (St). 21, apical view of a common form of hypopygium, aedeagus and vestiture omitted. 22, 'L-shaped' aedeagus of typical Proseninae. 23, left lateral view of hypopygium in a typical member of the Goniinae, vestiture omitted.



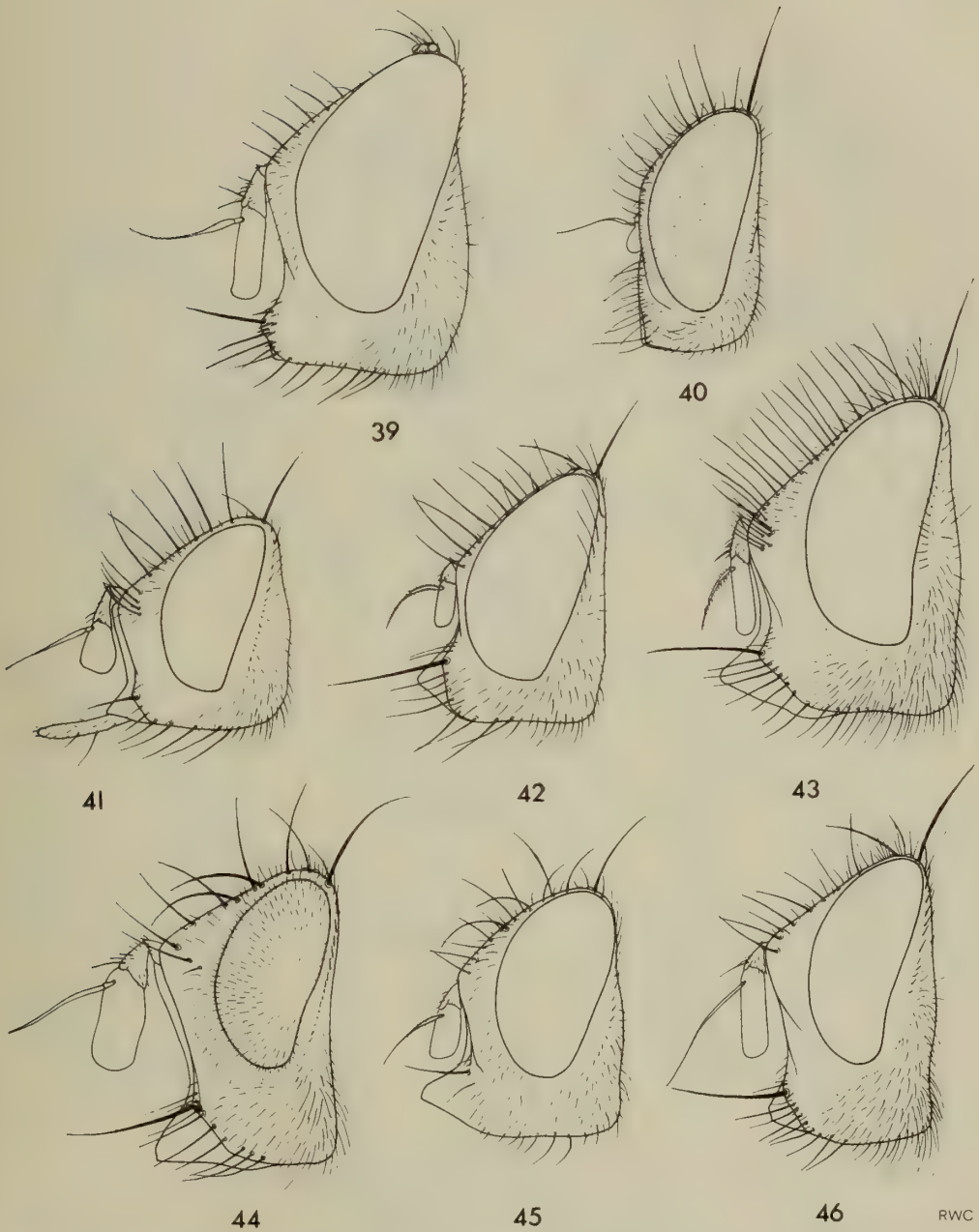
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FIGS 24-31. Head profiles in representative genera of Australian Tachinidae. 24, *Euthera* (♀). 25, *Gerocyptera* (♂). 26, *Saralba* (♂). 27, *Senostoma* (♂). 28, *Alophora* (subg. *Mormonomyia*) (♀). 29, *Ola* (♂). 30, *Platyntania* (♀). 31, *Rutilia* (subg. *Chrysorutilia*) (♂).



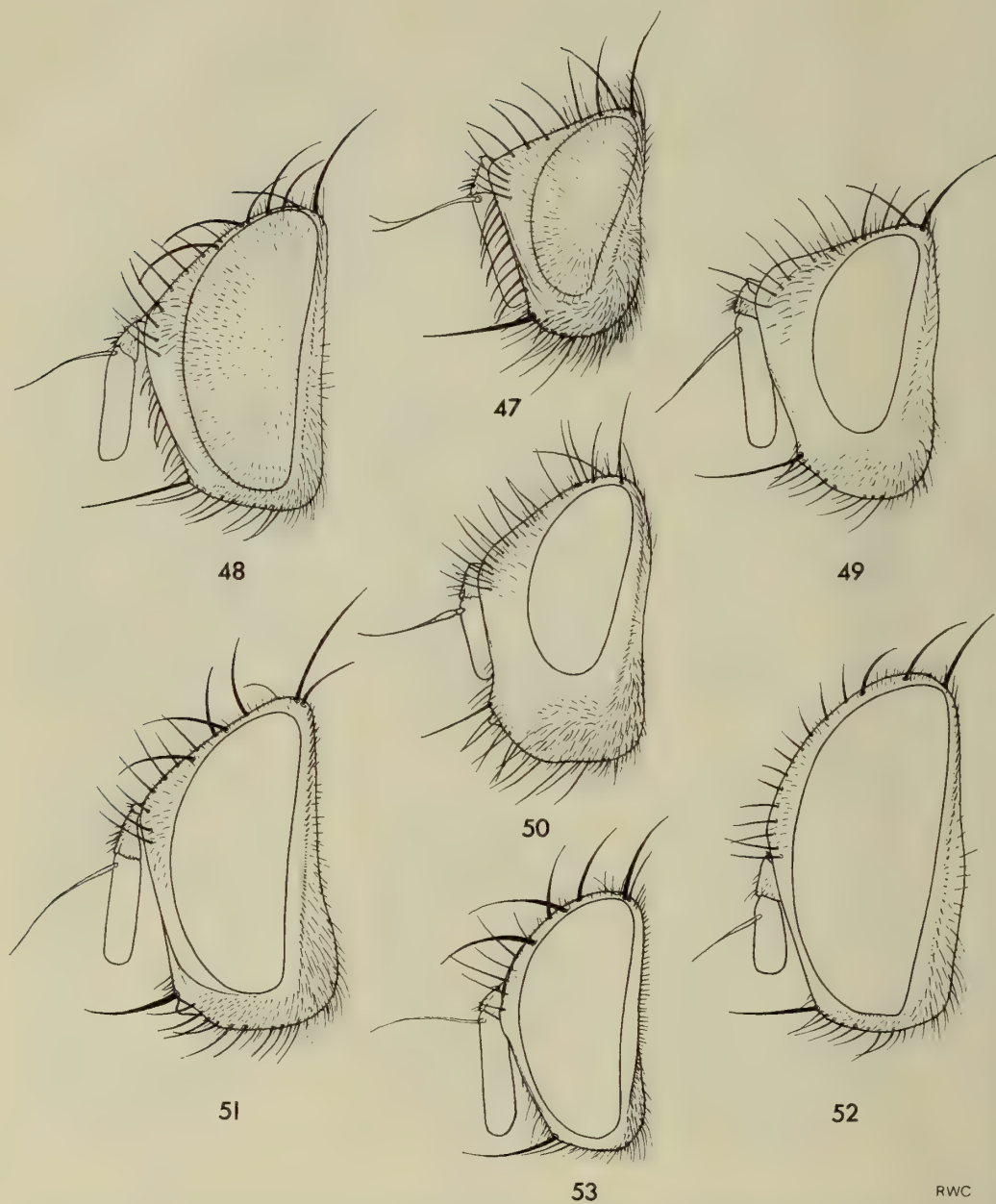
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FIGS 32-38. Head profiles in representative genera of Australian Tachinidae. 32, *Sumpigaster* (♂). 33, *Elpe* (♂). 34, *Doddiana* (♀). 35, *Thelaira* (♂). 36, *Halydaia* (♀). 37, *Voria* (♀). 38, *Nemoraëa* (♀).



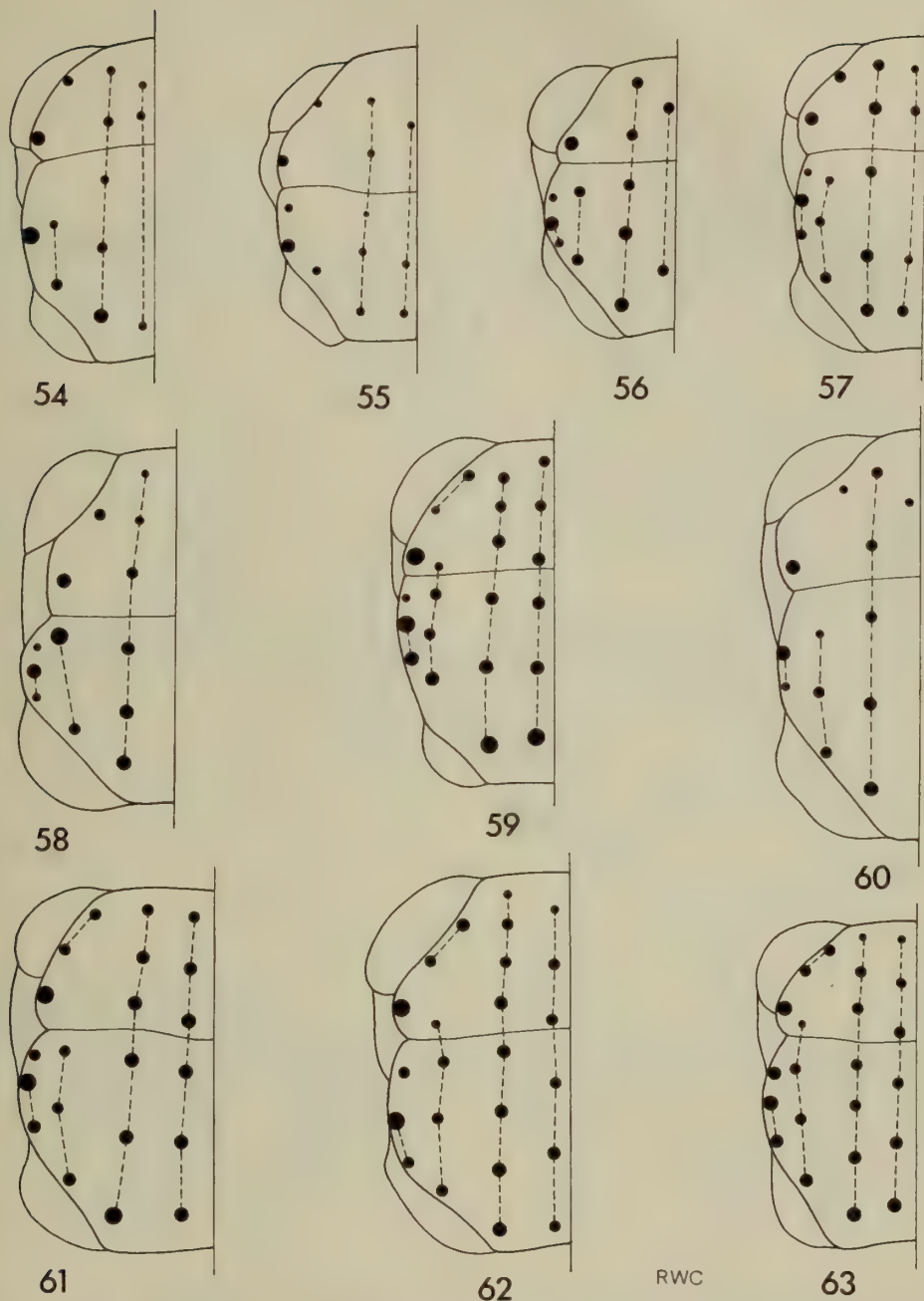
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FIGS 39-46. Head profiles in representative genera of Australian Tachinidae. 39, *Palpostoma* (♂). 40, *Myiotrixa* (♂). 41, *Exechopalpus* (♂), palp shown. 42, *Australotachina* (♂). 43, *Toxocnemis* (♂). 44, *Chaetophthalmus* (♂). 45, *Neximyia* (♀). 46, *Zita* (♂).



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FIGS 47-53. Head profiles of representative genera of Australian Tachinidae. 47, *Austronilea* (♂). 48, *Carcelimyia* (♀). 49, *Zenargomyia* (♂). 50, *Metaphryno* (♂). 51, *Palexorista* (♀). 52, *Korallimyia* (♂). 53, *Argyrophylax* (♀).



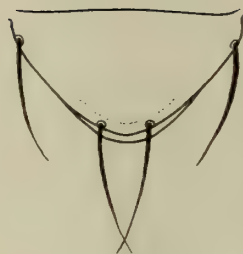
FIGS 54-63. Schematic representations of the main patterns of prescutal and scutal chaetotaxy in Australian Tachinidae. 54, Palpostomatini. 55, Ormiini. 56, Leucostomatini. 57, Glaurocarini. 58, Cylindromyiini. 59, Voriini. 60, Minthoini. 61, Linnaemyini. 62, Tachinini. 63, Sturmiini. *Note:* arrangement of setae is not necessarily constant in the tribes indicated, 'pore' sizes shown are exaggerated for clarity, and relative sizes of setae one to another can be gauged approximately from the sizes of the black circles. Figures based on specimens from following genera: 54, *Palpostoma*; 55, *Therobia*; 56, *Leucostoma*; 57, *Doddiana*; 58, *Cylindromyia*; 59, *Hyleorus*; 60, *Sumpigaster*; 61, *Chaetophthalmus*; 62, *Cuphocera*; 63, *Palxorista*.



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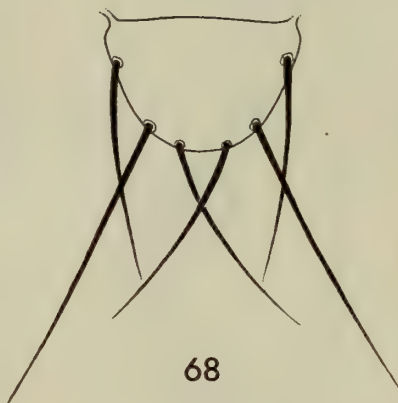
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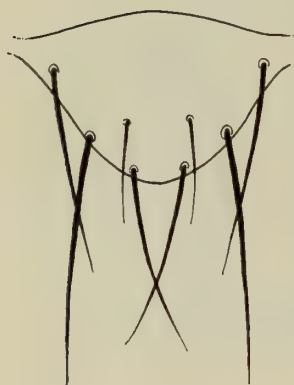
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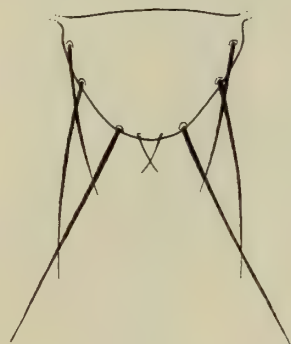
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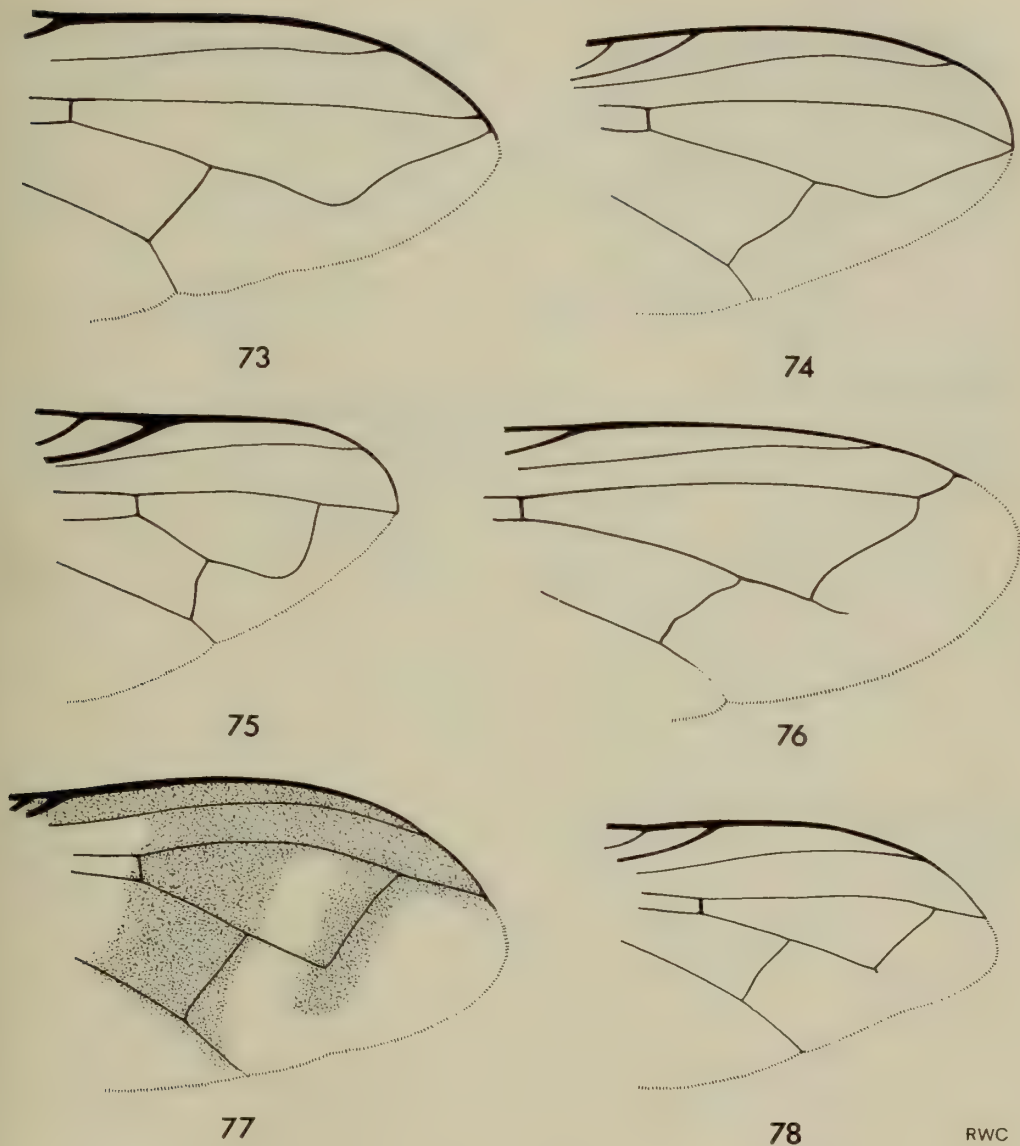
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FIGS 64-72. The main arrangements of scutellar setae in Australian Tachinidae. 64, in *Alophora* (*Mormonomyia*) (Phasiini). 65, in Palpostomatini. 66, in *Alophora* (*Hyalomya*) (Phasiini). 67, in Siphonini. 68, in Acemyini. 69, in *Voriella* (Neaerini). 70, in typical Prosenini, drawn from *Senostoma*. 71, in typical Blondeliini, drawn from *Monoleptophaga*. 72, in *Carcelia* and *Winthemia* and some other goniine genera in which subapical setae are unusually widely spaced.



FIGS 73-78. Wing venation in representative genera and tribes of Australian Tachinidae.  
 73, *Myiotrixa* (Myiotrixini). 74, *Pentatomophaga* (Trichopodini). 75, *Alophora* (*Hyalomya*) (Phasiini). 76, *Cylindromyia* (Cylindromyiini). 77, *Euthera* (Eutherini).  
 78, *Leucostoma* (Leucostomatini).

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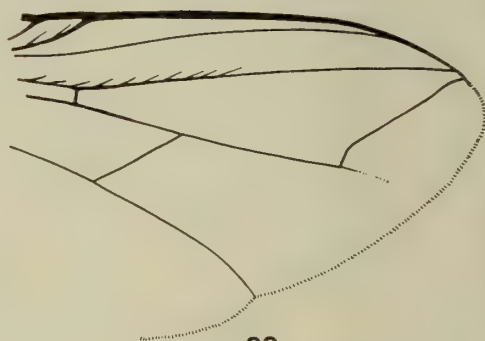
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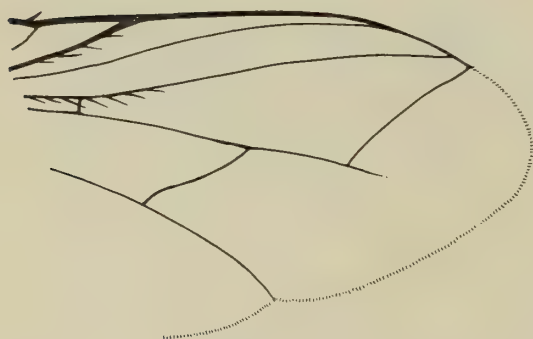
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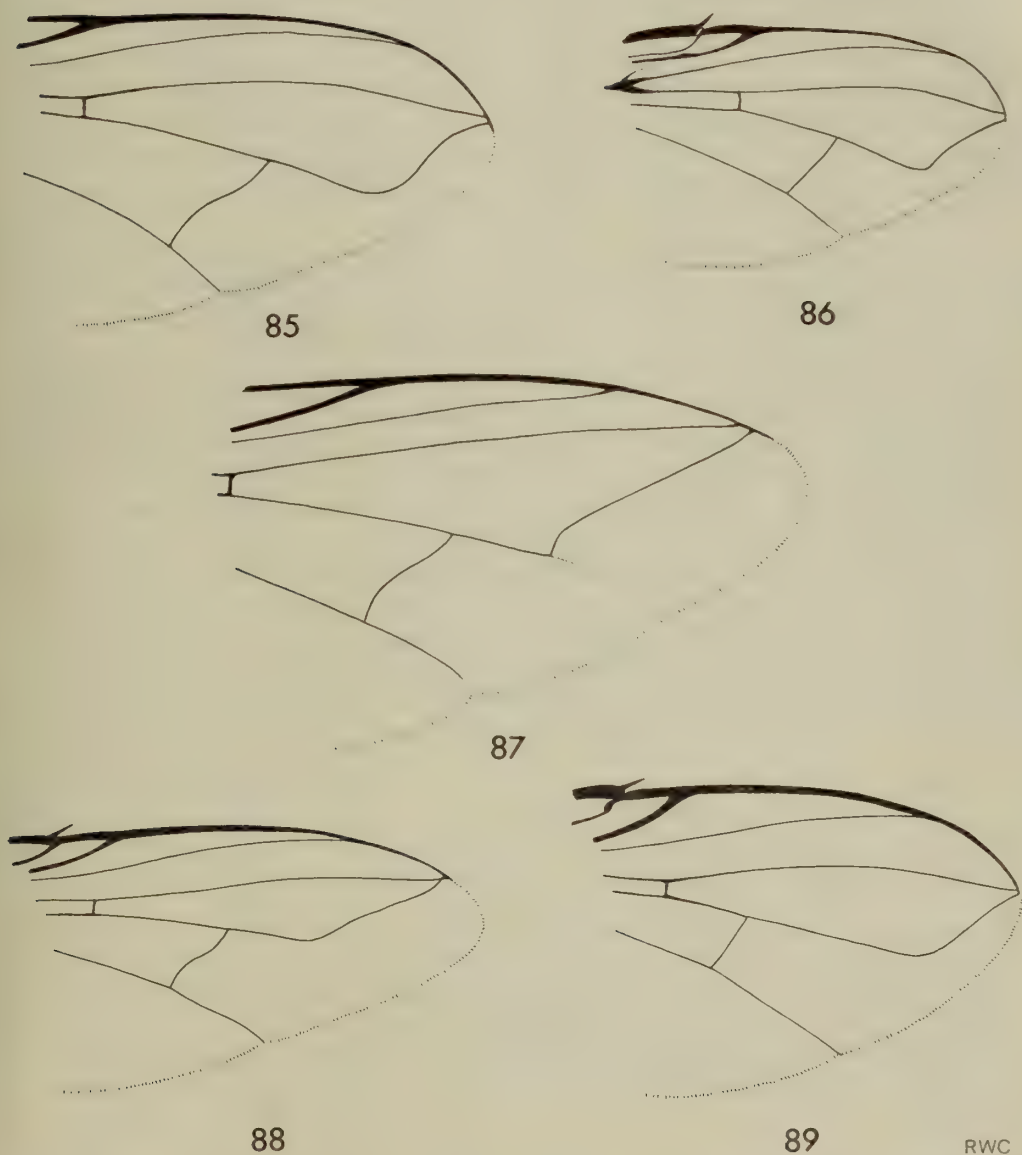
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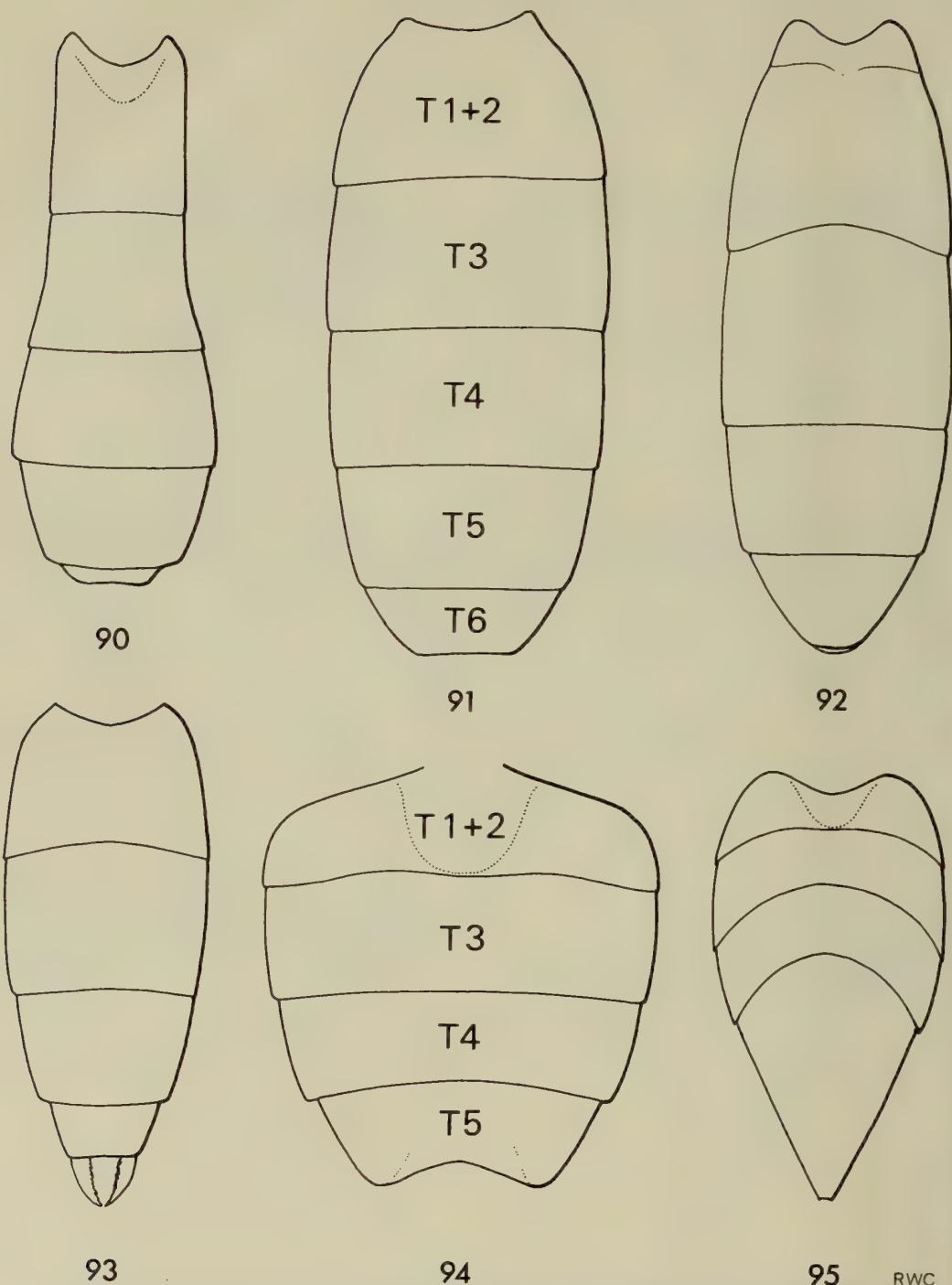
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FIGS 79-84. Wing venation in representative genera and tribes of Australian Tachinidae. 79, *Prosenina* (Prosenini). 80, *Prosenina* (Prosenini). 81, *Doddiana* (Glaurocarini). 82, *Hystricovoria* (Voriini). 83, *Voria* (Voriini). 84, *Hyleorus* (Voriini).



FIGS 85-89. Wing venation in representative genera and tribes of Australian Tachinidae. 85, *Trigonospila* (Blondeliini). 86, *Voriella* (Neaerini). 87, *Exorista* (Exoristini). 88, *Ceracia* (Acemyini). 89, *Ceromya* (Siphonini).

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FIGS 90-95. Abdominal shape in some Australian Tachinidae (vestiture omitted). 90, *Saralba* (Trichopodini). 91, *Pentatomophaga* (Trichopodini). 92, *Cylindromyia* (Cylindromyiini). 93, *Leucostoma*, ♀ showing forcipate apex to abdomen. 94, species of *Rutilia* with excavate T5. 95, *Teretrophora*, ♀ showing exceptionally elongate conical T5.

Two pertinent items of nomenclatural information became known while this paper was at the page-proof stage. These concern the generic name *Spoggosia* and the nominal species *Masicera viridiventris*.

(1) *Spoggosia* Rondani. In the present paper this name has been used as valid for a genus of Exoristini in accordance with the work of Mesnil (1947, 1956, 1960), but Herting (1972)\* has now discovered that the name *Chetogena* Rondani, 1856, applies to this genus and should be used as its valid name, since it has priority over *Spoggosia* Rondani, 1859. The genus *Chetogena* Rondani is widespread in Eurasia and Africa, and has one described and at least one undescribed species in Australia. The combination *Chetogena micropalpis* (Malloch, 1930) **comb. n.** is here established for the described Australian species. It should be noted that Herting (1972 : 8) spelt the name as *Chaetogena* but that the original spelling *Chetogena* is correct under the *Code*.

(2) *Masicera viridiventris*. Macquart (1847 : 84 & 1851 : 163) described two nominal species under this name, the later (1851) use of the name being a junior primary homonym of the earlier (1847) use. The earlier nominal species was described from Tasmania and the later one from Egypt. Townsend (1916c) cited the two *viridiventris* names as synonyms and stated that the cited provenance 'Égypte' for the later use was in error. During earlier work on Macquart's types (Crosskey, 1971 : 276) I was unable to find the type of *viridiventris* (2), purportedly from Egypt, and rejected Townsend's synonymy of the two *viridiventris* as unproven, but it can now be confirmed that Townsend was right. On a visit to Oxford University Museum in April, 1973, the female holotype of *M. viridiventris* Macquart, 1851, was found amongst the Palaearctic Tachinidae from Bigot's collection, and examination showed at once that the specimen is undoubtedly conspecific with, and the female of, *M. viridiventris* Macquart, 1847 (described from the male); the two types have been directly compared. The cited provenance of Egypt for *viridiventris* (2) is unquestionably in error, and the second use of *viridiventris* should appear as follows in the synonymy of *Tasmaniomyia viridiventris* (Macquart, 1847) on page 152 of this work:

*viridiventris* Macquart, 1851 : 163 (190) (*Masicera*). Holotype ♀, AUSTRALIA, prob. TASMANIA [publ. 'Égypte' in error] (UM, Oxford) [examined]. (Name a junior primary homonym of *M. viridiventris* Macquart, 1847, no replacement name required.)

The holotype of *viridiventris* (1851) is in fair condition, but has lost the right mid leg and the apices of some tarsi, the thoracic dorsum is rather crushed and the ptilinum partially extruded. It bears Macquart's original label reading '*Masicera viridiventris* ♀. Macq. n. sp.' and Bigot's collection label reading 'M Viridiventris. ♂. Egypt. Macq.' (the sex sign being erroneous). At the time of writing the holotype is still in the collection of the University Museum, Oxford, but it is hoped that consent will be obtained for it to be transferred to the British Museum (Natural

\* HERTING, B. 1972. Die Typenexemplare der von Meigen (1824-1838) beschriebenen Raupenfliegen (Dipt. Tachinidae). *Stuttg. Beitr. Naturk.*, No. 243, 15 pp.

History), where all other types of Tachinidae from Bigot's extra-Palaeartic material are housed. (It is germane to note here that on p. 294 of my 1971 paper I mistakenly implied that *all* the Tachinidae from Bigot's collection are in the BMNH. This is not so: all the extra-Palaeartic Tachinidae are in the BMNH, but the Palaeartic material, which includes some Macquart types as well as several Bigot types of Palaeartic nominal species, is in Oxford.)

#### INDEX TO FAMILY-GROUP NAMES

The following index is to names of Tachinidae only, host names being excluded. The main entries for each family-group taxon are indicated by **bold** type, the first bold number(s) referring to the treatment in the keys (Part I) and the second bold number referring to the catalogue entry (Part II). Numbers in italics indicate the pages on which figures appear.

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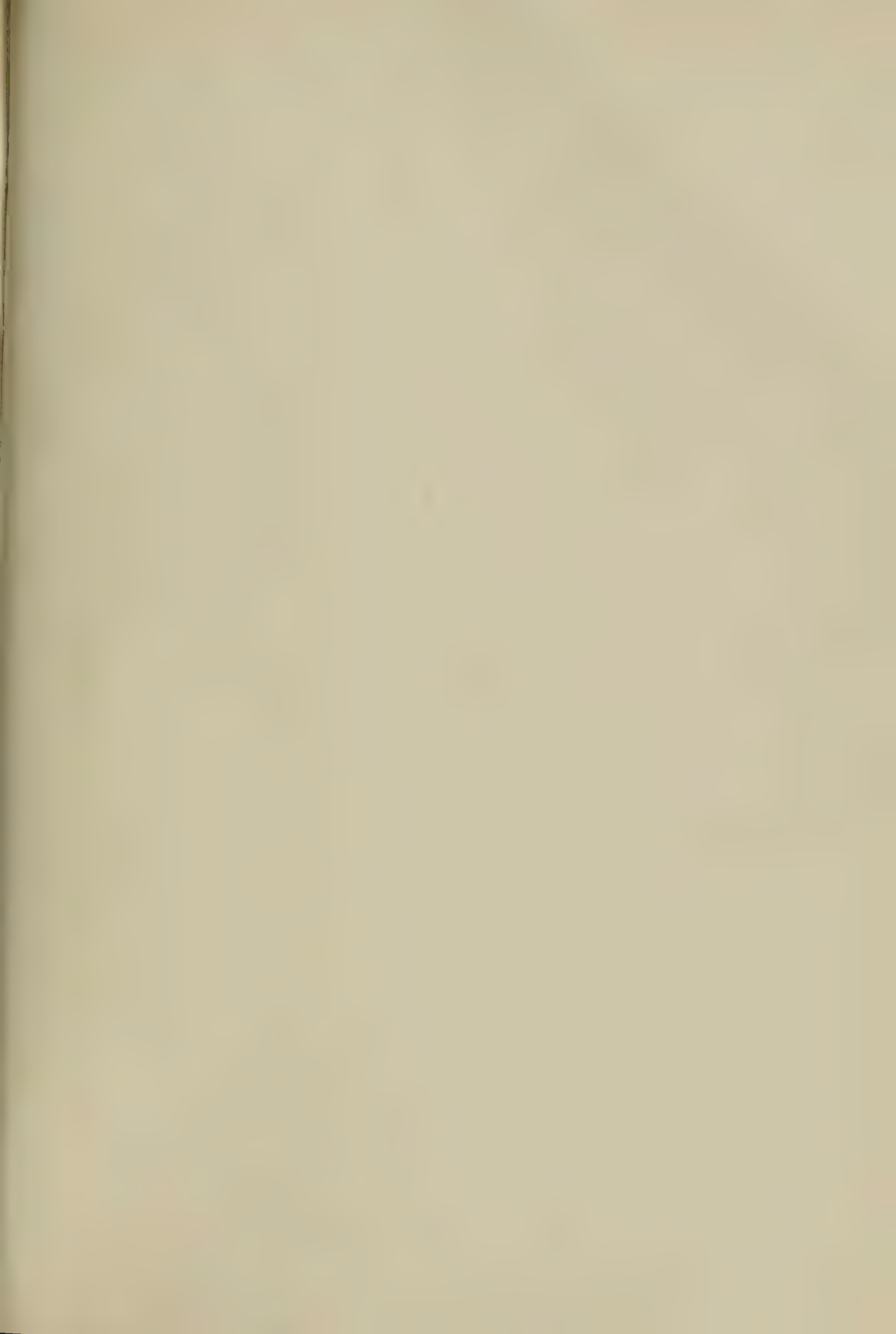
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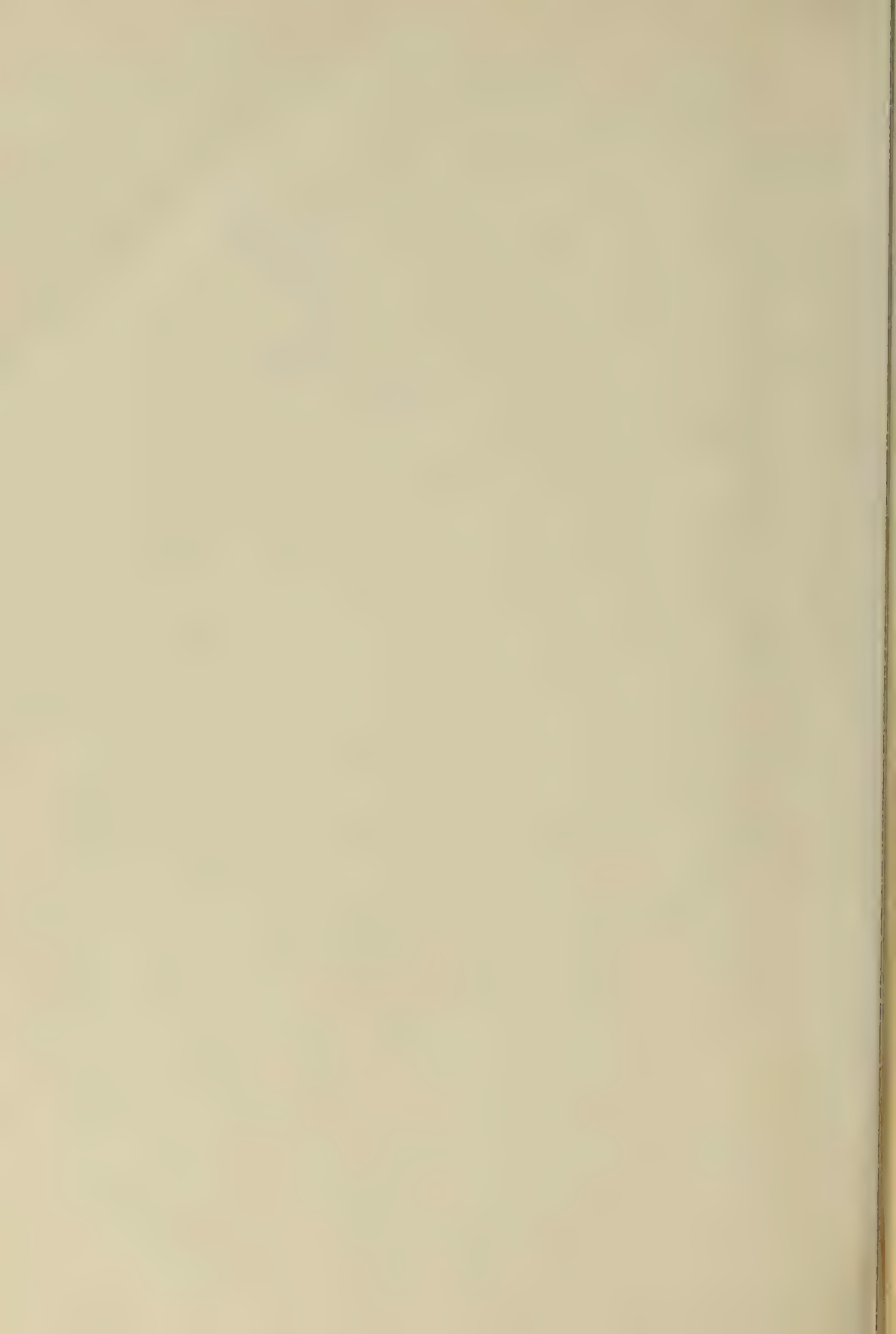
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